Volume 94 Number 4

STEEL

For forty-eight Years—IRON TRADE REVIEW

PRODUCTION • PROCESSING • DISTRIBUTION • USE

The Week in Perspective

COMPARED with recent vitriolic attacks upon the steel industry in regard to recognition of unions and the checkoff system at captive mines, the national labor board, when its hand was called for a decision, calmed down surprisingly and neatly straddled (p. 12) the vital issues involved. Potency of the board appeared further in doubt after the President summoned E. T. Weir to his side (p. 12) in the effort to arrive at an amicable labor agreement in the Weirton election dispute . . . . Shortage of skilled labor in the steel industry is envisioned (p. 11) as operations improve, one authority estimating that 125,000 more employes would be needed should the operating rate of the industry lift to 70 per cent.

Price Abdicates to Service, Quality, Integrity

Scarcely secondary to labor problems in the minds of administration leaders and legislators is the question of prices. Coming months will see careful scrutiny applied (p. 14) to price movements since the advent of NRA, the intent being apparently to "crack down" on any exorbitant increases. Incidentally, the federal trade commission, instigator of the multiple basing point plan for steel prices ten years ago, now does a right-about face and declares this system smacks (p. 14) of price fixing and monopolistic tendencies . . . . But to steel leaders NRA has meant (p. 10) an open-price system and the advent of new standards of merchandising in which the factor of price gives way in favor of service, quality and integrity . . . . Amid much bickering, the code authority for the scrap iron and steel industry was chosen (p. 13) at the sixth annual convention of dealers in Atlantic City, N. J., last week.

Production Problems Make Auto Builders Sweat

Whirling upward again, steel production last week for the country attained (p. 13) the 35 per cent level, 5 points over the preceding week. Stimulus was received mainly from the automotive industry, which is releasing steel specifications (p. 37) as volume production becomes necessary . . . . Streamlining and independent wheel springing, admirable though they may be for clinching sales, are something else (p. 15) for the production line where difficulties encountered have taxed the ingenuity of the industry's most capable engineers. Public reception of auto shows models, many of them engineless (p. 16) at that, has been so gratifying that opinion is being heard that the only limit to sales for the first half of the year, at least, will be the capacity of makers to produce cars.

Steel Lends a Willing Hand in the Laundry

While not a new market for steel, the manufacture of washing machine tubs (p. 23) is certainly a lusty and ever-growing one, about 11,000 tons of steel sheets being required last year. One company, supplying 2400 a day, makes the tubs from 18-gage enameling stock in a single draw. Complete facilities are maintained for spraying and baking enamel surfaces . . . . A smaller but important use of steel sheets is in the fabrication (p. 34) of containers to accommodate oily waste in industrial plants, 50 tons of strip and galvanized sheets being consumed annually in this work . . . . This week's lesson in plastic forming of metals (p. 30) deals with drawing processes, as applied principally to wire, rod and tubes.

Heat Treat Rail Ends To Reduce Heavy Wear

With economy the watchword in railroad operation, carriers should be interested in the development (p. 27) of a process for heat treating or "sorbitizing" rail ends to prevent wearing down under constant batter of traffic. Portable equipment is provided for preheating, heating and quenching the rail ends in the track . . . . Better to understand the performance of steel under high temperatures, a joint committee of two technical societies proposes (p 28) a three-year program to correlate creep tests, thereby obtaining data of much value to industries using metals under these conditions . . . . Qualifications and limitations of the spark test for carbon and alloy steels have been determined (p. 33) by applying the test to 280 materials of varying composition.

Grace Sees Merchandising Next Major Issue in Steel

OPEN prices on steel having freed the industry of "constant daily dickering and the waste motion of constant negotiation," new standards and factors are coming to the fore in selling, declares Eugene G. Grace, president of the Bethlehem Steel Corp., in an article in the February issue of *Scribner's Magazine* entitled "Industry and the Recovery Act."

These standards and factors, which will whittle down the cost of distribution and improve merchandising, are:

The character of the company.

Integrity in every policy.

Close relationship between salesman and customer.

Service by the producer in the way of metallurgical, engineering, or other specialized knowledge.

Sales co-operation with the distributor.

Reciprocity.

Undeviating quality of the goods as represented.

Says Mr. Grace:

"I believe that all of these points will tend toward higher standards in industrial selling. Take the point of reciprocity, which is frequently criticized. Within legitimate limits it is deeply rooted in human nature. Assuming that quality and service are equal, we all tend to do business with people who do business with us, and in whom we have confidence.

Respect "Legitimate" Friendship

"Friendships will play perhaps even a stronger part, and by that I mean legitimate friendships based on mutual respect. From now on, the salesman will sit less at his desk, and will meet with the customer more frequently. He will conduct himself at all times in a way to merit the highest confidence.

"We would all rather do business with individuals on whose integrity we can rely 100 per cent, and for whom we have a friendly feeling. For this reason I feel that business will operate more on that basis, will be more human and less impersonal."

And with this change in marketing practices a new utility for advertising, especially in those companies which make semifinished products, will develop, Mr. Grace believes.

"Until recently the steel industry and industries of a similar type have been extremely moderate in the use of advertising as a means of salesmanship," he states.

"In the consumer field advertising grew up as a necessary means of reaching large quantities of persons who could not be approached frequently by personal calls. Advertising, in short, is a medium which is always necessary in dealing with volume sales.

Eugene G. Grace

"Implications of this new freedom (under NIRA) have been too little recognized . . . our business structure is being put on a firmer basis, which will be helpful to our national economy."

"In the industries which sell to manufacturers, jobbers, and dealers the total number of purchasers is much smaller, and the urgency for advertising has been less pressing.

"Under conditions when sales were influenced by all sorts of concessions, now prohibited under the codes, the influence of the advertising message was, in any event, much minimized.

"We now face a very different condition. Selling will be on the basis of the points which I have mentioned, emphasizing the inescapable fundamentals of service, quality, and integrity.

"Advertising will help the sales force, by adding to the calls of the sales force a schedule of messages through the printed page. These messages will call on more people, more frequently than is possible for any sales force, no matter how large.

Provides Economical Contacts

"These advertising programs will cull out and catch the attention of prospective customers at the time when they are ready to buy, giving active leads to the sales force, and saving the waste motion of calling on inactive prospects.

"My comments here may seem like A, B, C, to those who are selling to the ultimate consumer, but I mention them because they are relatively new considerations in the selling practices of the so-called heavy industries.

"In short, in our new program for winning business, our industrial companies find ready at hand the useful function of advertising, the advantages and limitations of which

ROLLED STRUCTURAL SHAPES MAKE DURABLE BRIDGE FLOOR: Recently in this new swing span over the Choptank river, built for the Maryland state road commission, the interlocking channel system developed by the Belmont Iron Works, Philadelphia, was used. The floor assembly consists of steel shapes, placed alternately flanges up and flanges down, with the flanges interlocking and securely welded, as described in STEEL, *Nov.* 9, 1931, *page* 341. *This bridge roadway is* 24 *feet wide and* 210 *feet long; J. E. Greiner Co., Baltimore, the construction engineer*

have already been thoroughly tested in the general consumer field."

Many other phases of NRA are discussed by Mr. Grace in his article in the February issue of *Scribner's Magazine.*

U. S. Steel Corp.

WHILE each week brings the United States Steel Corp. nearer to consummating its plan for decentralizing operating control in New York and setting up a single control in districts such as Pittsburgh and Chicago, no definite step has yet been taken. Newspaper reports that some action may be expected about Feb. 1 are not confirmed in New York. (See STEEL for Dec. 4, 1933, p. 10)

Financial

GULF STATES STEEL CO., Birmingham, Ala., reports net profit of $138,498 in the fourth quarter, compared with loss of $46,235 in the same quarter of 1932. As indicated by quarterly reports, the 1933 profit of Gulf States was $193,041, compared with a loss of $518,315 in 1932.

¶United States Pipe & Foundry Co., Burlington, N. J., net loss in 1933 was $24,443 compared with a 1932 deficit of $1,273,054.

¶National Steel Corp., Pittsburgh, has declared a quarterly dividend of 25 cents, payable Jan. 30 to record of Jan. 20.

¶Acme Steel Co., Chicago, earned $2.75 a share in 1933, against 6 cents a share in 1932. Corporate surplus increased from $698,045 to $1,272,578 during the past year.

¶Allegheny Steel Co., Pittsburgh, has declared the regular quarterly preferred dividend of $1.75, payable March 1 to Feb. 15 record.

¶A. M. Byers Co. and subsidiaries, Pittsburgh, reports net loss of $1,044,056 for the fiscal year ended Sept. 30, 1933, this loss being after taxes, depreciation, depletion and amortization of patents charges. By comparison, the preceding fiscal year showed a loss of $922,353.

¶Great Northern Iron Ore Properties have declared a dividend of 50 cents on certificates of beneficial interest, payable Jan. 30 to record of Jan. 15. This is the first payment since December, 1931, when a distribution of $1 was made.

¶Bethlehem Steel Corp. officials in a recent letter to the New York Stock Exchange declared their intention fully to perform obligations with respect to all Corporation bonds. However, the company declines to pay bond coupons in foreign currency unless holders are bona fide residents abroad, and quotes law to prove that it is within its rights in following this policy.

New Capacity

REPUBLIC STEEL CORP., Youngstown, O., which confirms the purchase of 15,909 common shares of Gulf States Steel Co., Birmingham, Ala., indicating a working agreement if not a merger, is reported planning to install equipment for making electric welded pipe, thus making Gulf States the pipe mill nearest to the Southwestern oil fields.

¶American Rolling Mill Co., Middletown, O., which purchased the Belfont Steel & Wire Co., Ironton, O., at receivers sale, contemplates a $100,000 improvement program preparatory to reopening the Belfont wire nail mill.

¶Youngstown Sheet & Tube Co. will rearrange the universal plate mill at its Indiana Harbor, Ind., plant as it did a similar mill recently at its Brier Hill plant in Youngstown, O.

Washington

FEDERAL trade commission, concluding its investigation of the merger of the Vanadium-Alloys Steel Co., Latrobe, Pa., and Colonial Steel Co., will order the Vanadium company to divest itself of the outstanding capital stock of Colonial.

Both companies manufacture tool steel. The commission's finding is that Vanadium's acquisiton of the entire outstanding common stock of Colonial—then 32,000 common shares of $100 par—violated section 7 of the Clayton act and tends to substantially lessen competition between the two.

Hearings were held by the commission in New York, Boston, Chicago, Detroit, Cleveland and Pittsburgh. The commission has issued the full text of its findings and opinion and will enter an order against Vanadium later. An appeal by Vanadium is possible.

¶Secretary of the Treasury Morgenthau finds that woven wire fencing and netting made in Germany has been dumped in the United States, substantiating the complaint of the American Iron and Steel institute more than a year ago, and has issued a dumping order. This is the only institute complaint of dumping that has been upheld.

Labor

A SHORTAGE of skilled labor in the steel industry if mill operations reach expected high levels this spring is forecast by Walter S. Tower, executive secretary of the American Iron and Steel institute.

At least 125,000 additional employes will be needed if 70 per cent of capacity is engaged, it is estimated. At the beginning of December, when the industry was operating at 29 per cent, the number of employes was 399,369. In October, when the average was 37 per cent, employes totaled 416,277.

"Under the employment provisions of the Code," Mr. Tower says, "the

THEY LIKED BEING TAKEN FOR A RIDE: The end of the line for the special train which brought eastern representatives of Joseph T. Ryerson & Son Inc. to Chicago for the recent Ryerson sales convention. Boston and then the New York and Philadelphia contingents were assembled for this special. The Cincinnati, Cleveland, Detroit, St. Louis and Buffalo groups came in special cars, while Milwaukee motored down. Edward L. Ryerson Jr. welcomed the group. Everett Graff, executive vice president, outlined the current position and immediate objectives. H. B. Ressler, vice president in charge of sales, arranged the three-day convention, at which over 200 were in attendance

iron and steel industry added more than 60,000 employes, before the close of 1933, despite the sharp decline in operations. Monthly pay rolls during the closing months of 1933 were at the rate of approximately $70,000,000 a year greater than last June."

¶Although the national labor board straddled the main issue—union recognition—in its decision in regard to captive coal mines in western Pennsylvania of the United States Steel Corp., the Corporation clearly wins more than it loses. The decision, issued Friday, will be duplicated in regard to independents, the board states.

Contracts between the Corporation's mines and its workers shall refer to John Lewis and Philip Murray in their official capacities as officers of the United Mine Workers of America as well as representatives of labor in the mines, according to the board.

Whether this constitutes union recognition is not a matter within the jurisdiction of the board, the ruling states. The Corporation, like independents, has been willing to treat with any representatives elected by its employes, but on the basis of these representatitves speaking on behalf of the labor involved and not for the union.

In regard to the checkoff, the board approved inserting the standard United Mine Workers contract in the agreement, but ruled that any miner who desires to assign any portion of his wages to another organization may do so. This is exactly in line with the contention of the mine owners.

¶E. T. Weir, chairman, National Steel Corp., was in conference last week with President Roosevelt relative to an adjustment of the controversy between the Weirton Steel Co., a subsidiary of National Steel, and the national labor board over the Dec. 15 election of employe representatives for collective baragining. The President expressed the hope that a solution of the case could be reached; Mr. Weir assured him that every effort was being made.

¶Acheson Oildag Co., Port Huron, Mich., increased salaries and wages 5 per cent Jan. 1.

Canada

WHETHER the Canadian tariff on boiler tubes is altered to allow imports either from Great Britain or the United States under more favorable terms apparently depends upon the Page-Hersey Tubes Ltd., Toronto, Ont.

A Montreal agency negotiating for imports of tubes from Great Britain will not object to a tariff of 5 per cent British preference, 10 per cent intermediate and 15 per cent general on sizes 2½ to 4 inches if Page-Hersey will supply a product comparable to that obtainable in Great Britain or the United States.

Transportation

HEARING opened in the United States district court in Chicago, Jan. 15, on the government petition to force the United States Steel Corp. to sell the Elgin, Joliet & Eastern railroad or discontinue the transportation of Corporation products on the road.

Since 60 per cent of the road's traffic originates in Corporation subsidiaries, a violation of the commodities clause of the interstate commerce is alleged. Corporation officials declare that ownership of the railroad is remote and that it does not participate in its operation.

Incorporated in 1882, the Elgin, Joliet & Eastern has 447 miles of track in Illinois and Indiana, connecting Corporation plants in the Chicago district and serving the Chicago terminal area.

¶American Trucking Association Inc., claiming to speak for 2,000,000 truck operators employing 3,500,000 men and representing an investment of $5,000,000,000, has petitioned congress, NRA Administrator Johnson, and Railroad Co-ordinator Eastman to hold in abeyance plans for regulating trucking, pending a trial of the trucking code. The Truck association alleges the railroads are cutting rates to put trucks out of business.

¶Propaganda distributed by the National Lumber Manufacturers association, Washington, is aimed to persuade shippers to specify wooden instead of steel box cars, especially during hot weather. The association cites shippers' complaints that the humidity in a wooden car is more constant than in a steel car, and that there is less danger of condensation of moisture.

Codes

IMPORTANT in the general wholesale code effective Jan. 22 and covering iron and steel jobbers is a differential clause recognizing the wholesaler's function and permitting price differentials "which shall be fair and reasonable in relation to the nature and extent of the distributing services and functions rendered by each buying class."

This clause was especially opposed by mail order and catalog houses, chain stores and others calling themselves semijobbers. It is claimed to be of special benefit to the hardware trade.

¶New procedure by NRA for approval of codes and amendments to them is believed to be handicapping administrators. In the order named, steps required for the approval of codes are the report of the statistical and research division, report and approval of the legal division, industrial board, consumers' board, labor board, deputy administrator, division administrator, executive officer, assistant administrator for the industry, assistant administrator for labor, and the administrator.

¶NRA Administrator Johnson has approved the code for the metal window industry, specifying a 40-hour week, a 40-cent hourly minimum for factory workers and a $15 weekly minimum for office employes. The code, effective Jan. 22, is No. 207.

¶Future code hearings: Tackle block industry, Jan. 23; metal etching and warm air register industries, Jan. 25; manganese industry, Jan. 26; steel wool and supplement to the shovel, dragline and crane industries, Jan. 29.

¶Deputy NRA Administrator Malcolm Pirnie, in charge of the construction codes, has resigned to resume private engineering practice in New York. Col. Robert H. Montgomery, accountant, has been appointed chief of the NRA research and planning division.

Institute

COMMERCIAL resolution No. 42, effective Jan. 18, permits makers of pipe and other tubular products to sell their products to other manufacturers who do not make certain sizes of products and desire to round out their line. For this purpose a manufacturer may grant a discount of 5 per cent of the base, plus the deduction permitted to jobbers.

¶Commercial resolution No. 43, effective Jan. 18, relates to water shipments of pig iron. On shipments of 400 tons or more on the Ohio, Monongahela and Allegheny rivers the shipper may make an allowance of 60 cents a ton, with a minimum delivered price of the base plus 50 cents.

On water shipments of 1500 tons or more to Saginaw, Mich., a reduction of $1.35 per ton is permitted, and on shipments to Muskegon, Mich., an allowance of $1.50 is permissible. It is further provided that if the purchaser requires the iron to be delivered in bottoms provided by the purchaser, an additional reduction of 50 cents to Saginaw and $1.15 to Muskegon is permissible.

On shipments of 400 tons or more to purchasers at Phillipsdale, R. I.; Branford, Conn.; Bridgeport, Conn.; Yonkers, N. Y.; Brooklyn, N. Y.; Elizabethport, N. J.; Roebling, N. J.; Burlington, N. J.; or Florence N. J., the allowable reduction for water shipment is a maximum of 60 cents.

¶Commercial resolution No. 44 governs delivered prices on material sold to the government for shipment over railroads, such as land grant roads, where freight rates to the govern-

ment are lower than published tariffs. In these cases, producers shall allow the government the full published tariff, but arrange that the government take title to the products as a producing plant.

¶Following meetings last week at which Walter S. Tower, executive secretary of the institute, explained the steel code to producers in the Chicago and Cleveland districts, meetings have been arranged for the Duquesne club, in Pittsburgh, Jan. 23, and at the Hotel Benjamin Franklin, Philadelphia, Jan. 24.

Uses of Steel

SOFT drinks as well as beer offer a market for steel containers. Coca Cola Co., Atlanta, Ga., has placed an order for 1000 stainless steel drums for shipping its syrup to scattered bottling plants.

Some of the new containers, which replace wooden packages, are being fabricated by the Stevens Metal Products Co., Niles, O., from low carbon 18-8 chrome-nickel steel, a large share of the steel being supplied by the Republic Steel Corp., Youngstown, O.

Each drum is of 55-gallons capacity, resistance welded. Low carbon steel was specified to avoid any possibility of corrosive action at or adjacent to welds. All flanges and fittings are stainless steel, arc welded.

¶All-steel roadways for mines were featured at the recent South Wales engineering exhibition at Cardiff. This is said to consist of "8 feet diameter steel arches mounted on steel stilts, the arches being tied by inter-locking steel-tie bars. An arch roadway can be constructed at the low cost of sixpence for each tie-bar and is stated to be as strong as a fully bricked arch. No nuts, bolts or screws are necessary."

¶The largest trawler in the world —the JUTLAND built for French owners in Denmark—is equipped with an iron and steel winch weighing 23 tons and capable of handling 1200 fathoms (7200 feet) of steel rope used for dragging fish gear.

Foreign

MORE than 60,000 workers at Magnitogorsk, the big new steel city of Russia in the Ural mountains, must go to and from their work daily afoot in cold ranging from zero to 40 below because the only municipal transportation is two buses, it is charged in an official Moscow paper excoriating conditions at Magnitogorsk.

"Socialist pigsty" is the description of this reputed Pittsburgh of the Urals by this official paper of the commissariat for heavy industry. Annual labor turnover is said to exceed 100,000. During the fourth quarter of 1933 one cake of toilet soap was issued for each 15 persons. For amusement, there is one "talkie" and one circus.

¶Colvilles Ltd., Glasgow, has acquired the steel plate business of Stewarts & Lloyds Ltd. This corrects the erroneous statement conveying the exact opposite meaning as printed in STEEL for Dec. 4, 1933.

¶Japan reports the discovery of large deposits of nickel ore, covering 16,500,000 acres, near Kodoko through the Nippon Chemical Research institute, Osaka, Japan.

Production

STEELMAKING operations snapped back 5 points in the week ended Jan. 20 to 35 per cent, thereby recouping all of the ground lost since the last week of December. Indications point to a further rise this week, due chiefly to increased releases from automotive consumers.

Pittsburgh: Gained 3 points to 24 per cent last week, with further increase indicated. Carnegie Steel Co. has blown in one Carrie and one Clairton stack, but has banked one at Edgar Thomson. National Tube Co. has lighted a McKeesport stack. Pittsburgh Steel has not yet blown in its Monessen stack. The net result is an increase of two in active blast furnaces to 17 out of 60.

Youngstown: Increased 11 points to 37 per cent and expected to hold at or slightly below that level this week. A vigorous improvement is expected about Feb. 1. Thirty-two out of 83 open hearths are melting.

Birmingham: Unchanged at 52 per cent and apparently steady so long as the Ensley rail mill operates. New rail business is in sight.

Wheeling: Increased 2 points last week to 64 per cent, 25 out of 39 open hearths being on. This week two more furnaces will be on, putting the rate up to 68 per cent.

Buffalo: Up 3 points to 32 per cent, with little change indicated for this week. Some steel still is being produced for stock in anticipation of automotive releases. Twelve out of 38 open hearths are on.

New England: Off 2 points to 86 per cent and probably down to 80 per cent this week.

Cleveland-Lorain: Up 5 points to 59 per cent. Corrigan, McKinney Steel Co. is operating eight open hearths, Otis Steel Co., seven; National Tube Co., eight. Corrigan, McKinney and Otis each will add a furnace this week.

Central eastern seaboard: Up 3 points to 24½ per cent, with further rise likely this week due partly to increasing rail releases.

Chicago: Dropped 3 points to 29 per cent due to curtailment of production for stock. Steady or rising trend is in early prospect.

¶Daily average sheet steel sales in December were 3557 net tons, up from 2945 tons in November, according to the National Association of Flat Rolled Steel Manufacturers, Pittsburgh. Production also increased, from 3419 tons to 3648 tons; shipments from 3319 tons to 3609 tons.

Total sales for month were 110,263 tons; production, 113,111 tons; and shipments, 111,867 tons. Unfilled tonnage Jan. 1 was 92,831 tons; Dec. 1, 94,270. Total sheet capacity in the United States for December was approximately 550,000 tons, and the capacity on which the association's figures are based was 325,000 tons.

¶Otis Steel Co., Cleveland, believes it established a world's record Jan. 17 when its continuous mill rolled 1800 tons of steel 62 inches wide.

Scrap Group Sets Up Code Authority

WITH the code for the scrap iron and steel industry now awaiting signature of President Roosevelt, selection of a code authority to administer the co-operative agreement occupied the attention of 400 dealers, representing all 13 chapters of the Institute of Scrap Iron and Steel Inc., in session for three days last week at the Ambassador hotel, Atlantic City, N. J., the sixth annual convention of the institute.

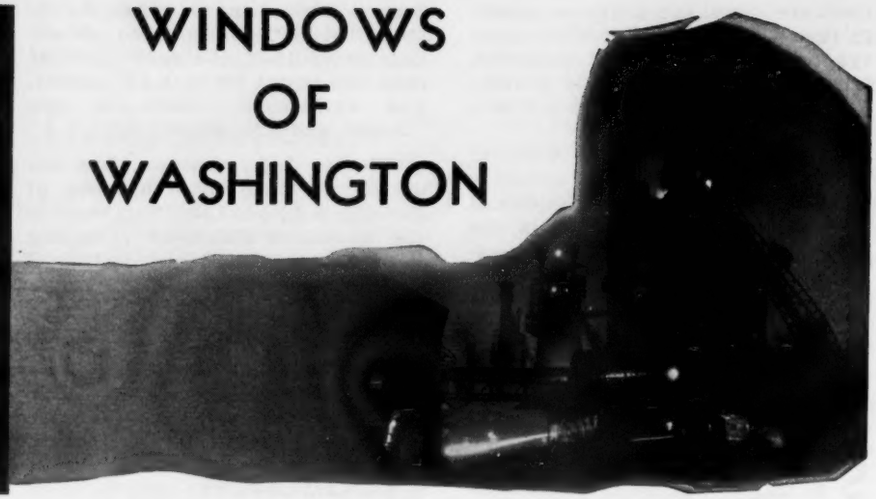
Attendance was the largest of any convention ever held by the institute, probably as an outgrowth of keen interest of members in code problems.

National board of directors of the institute met Tuesday as the convention opened, and passed a resolution authorizing the election of the code authority, a provision of the code being that it shall be administered by a group chosen by the board of directors of the institute. The board determined that in the selection of the code authority, all members in good standing should have an opportunity to indicate their choices.

Eight dealers subsequently were elected to the code authority in a closely contested vote. In the order of their selection, they are: Joel Claster, Luria Bros. & Co., Reading, Pa.; Darwin Luntz, Luntz Iron & Steel Co., Canton, O.; Michael V. Bonomo, L. Schiavone & Bonomo Bros., Jersey City, N. J.; Ben P. Williams, Hickman, Williams & Co., St. Louis; Charles Dreifus, Charles Dreifus & Co., Pittsburgh; Dan R. Cohen, D. R. & F. A. Cohen, Chicago; Joseph V. Kiley, T. J. Kiley & Son, Boston; and

(*Please turn to Page* 16)

WINDOWS OF WASHINGTON



WASHINGTON

WHEN Senators Borah and Nye last week launched their oblique attacks upon NRA, contending that under it the small business man was being oppressed and the consumer threatened with unwarrantedly high prices, they gave steel its cue.

Price is rapidly becoming the paramount issue. It seems safe to predict that before congress has adjourned the movement of prices in all major industries since NRA came into being will be scrutinized.

Putting men back to work and expanding payrolls are coming to be regarded as something expected of industry as a matter of course. The President may talk of the necessity of lifting commodity price levels to the 1926 level, but analyzed, this simmers down to little more than farm products.

For the moment, organized labor is sitting on the sidelines. It has been muttering all along that common labor wage rates were too low, and any evidence turned up that industry has been advancing prices briskly will be grist for its mill, and its mill will grind finer for labor and coarser for the stockholder.

While the consumers' board of NRA has received a fair number of complaints concerning tool steel and some alloys, so far as known no serious protest has been lodged against tonnage products.

But on some specialties, the complaints are vigorous. Doubling and tripling of quotations are charged, and where base prices have been reduced the extras have been increased so as to leave delivered prices little changed, it is contended. To Washington, however, steel is steel.

In the administration are some who are thoroughly sold on the theory that steel is a tonnage industry. This group has maintained from the first that, if anything, steel should be lowered in price in order to attract tonnage that would ultimately induce profitable operations.

One economist in the government believes that no price adjustments should be attempted until the industry has attained approximately a 60 per cent operating rate. At that level, overhead and other fixed costs would be spread over so much more tonnage that mills would profit.

The automobile industry, largest single buyer of steel, is no friend of the steel industry at court in the matter of prices. One of the best automotive purchasing minds in Detroit takes this position:

In the past, steel's largest customers—the railroads, building, pipelines and so on—have not put steel in the hands of the ultimate consumer. Automobile manufacturers, by putting in every garage what amounts to a finished steel product, are in fact a further finishing department and an extension of steel sales forces. Hence it is to steel's interest to keep unit prices down, aid in keeping automobile prices as low as possible, and bid for tonnage.

While automotive interests have not been reluctant to state their position concerning prices in high places in Washington, the chief arguments, it can be said, are being directed to producers themselves, the goal being the establishment of a differential basis through a commercial resolution of the American Iron and Steel institute.

Another outcropping of the price situation, indicating how times change, is in the federal trade commission's forthcoming report on the multiple basing point system in steel. While newspapers have credited the President with asking for the study and report, General Johnson last week accepted the parentage.

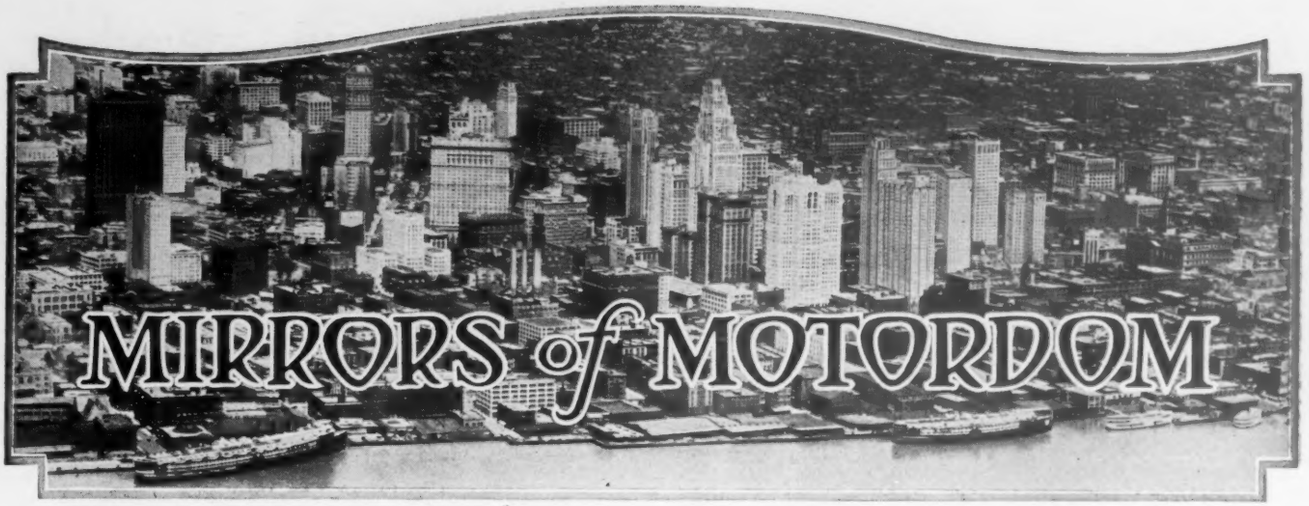
Almost exactly 10 years ago the trade commission, having concluded its famous and protracted Pittsburgh-plus proceeding, ruled that the Pittsburgh base on finished steel products was inimical to Chicago and consumers in other producing centers and handed down the ruling—never contested—that set up Chicago, Birmingham, Cleveland, Duluth and other points as a base for products made there.

Now, apparently, the trade commission appraises multiple bases established at its own insistence as permitting price fixing and tending to foster monopolistic practices.

Government by Alphabet

(Corrected to Jan. 19)

AAA—Agricultural Adjustment Administration
CAB—Consumers' Advisory Board
CC—Consumers' Council
CCC—Civilian Conservation Corps
CCC—Commodity Credit Corporation
CSB—Central Statistical Board
CWA—Civil Works Administration
EC—Executive Council
ECPC—Executive Commercial Policy Committee
EHFA—Electrical Home and Farm Authority
FACA—Federal Alcohol Control Administration
FCA—Farm Credit Administration
FCT—Federal Co-ordinator of Transportation
FDIC—Federal Deposit Insurance Corporation
FEHC—Federal Emergency Housing Corporation
FERA—Federal Emergency Relief Administration
FHLBB—Federal Home Loan Bank Board
FSRC—Federal Surplus Relief Corp.
GSC—Grain Stabilization Corp.
HOLC—Home Owners' Loan Corp.
IAB—Industrial Advisory Board
IBRT—Interdepartment Board on Reciprocal Treaties
ICC—Interstate Commerce Commission
ITPC—Interdepartmental Trade Policy Committee
LAB—Labor Advisory Board
NCB—National Compliance Board
NEC—National Emergency Council
NIRA—National Industrial Recovery Act
NIRB—National Industrial Recovery Board
NLB—National Labor Board
NPB—National Planning Board
NRA—National Recovery Administration
PCA—Petroleum Code Administration
PRA—Presidential Re-employment Agreements
PWA—Public Works Administration
PWEHC—Public Works Emergency Housing Corp.
RFC—Reconstruction Finance Corp.
SAB—Science Advisory Board
SBPW—Special Board of Public Works
SRB—State Recovery Board
TCFT—Temporary Committee on Foreign Trade
TVA—Tennessee Valley Authority
USES—United States Employment Service



More Customers Than Cars

• • •

Chevrolet Up To 1000 Day

• • •

Ford Really Merchandising

DETROIT

IN THE past three depression years, when there were comparatively few buyers and little pressure for delivery, all the mechanical changes which automobile manufacturers introduced were easily adapted to quantity production, assembly lines started up smoothly and swiftly on new models, and by early January dealers' floors were stocked.

And then the industry had to pick this year, with the country emerging from the depression and new car interest the greatest since 1929, to go to independent springing of front wheels and radical streamlining, which together present more "bugs" to iron out than in any previous model change in history—with dealers' floors bare and customers crowding for delivery.

Progress is being made, of course, in attaining production, and the boast of automotive engineers that they can lick any problem is no idle one. In the meantime, however, precious time is being lost—time which some manufacturers with limited facilities cannot recoup; and even more damaging, disquieting doubts are being raised in the minds of prospective buyers.

These doubts are peculiar ones, in that sentiment transcends logic. It goes without saying that neither General Motors nor Chrysler would introduce such radical changes in chassis or body without subjecting them to the most exhaustive tests. It can be accepted that on proving grounds and in driving simulating the experience of the average owner, the new coil springs have stood up, and streamlining has a scientific basis.

Difficulties now being encountered are purely mechanical ones in achieving volume output, and are only of academic interest to buyers. They start at steel mills, some of which will not attempt to hot roll bars to a tolerance of only 0.004-inch. They include heavy breakage and many discards in manufacturing operations, and an entirely new routine in assembling frames and front ends. The industry is proving that even if it has to build its own equipment, it can make and assemble any part on a large scale.

WHILE demand for 1934 models already is sufficiently broad to encourage the industry to expect almost a boom year, nevertheless, enough of the public is viewing the changes with a calculating eye and is confusing delay in production with a suspicion of design, so as to indicate the necessity for a thorough educational campaign. This is now under way.

Most buyers are accepting the industry's word for it, but some are wondering what a smashup or careless parking will do to independently hung front wheels. They see upward of 20 additional points for lubrication—and wear. They are speculating whether brake and wheel alignment adjustments will be more difficult. They are learning that on some streamlined cars two men are required to raise the hood and replenish crankcase oil, and that on one model the right front wheel must be removed for access to valve tappets.

It is not passing judgment but relaying sentiment widely encountered in Detroit that a selling job has to be done on such points. A report also is current that two heavy cars which have just come out with the new coil springs will also offer the semi-elliptic type as optional.

There is some comment, too, on the fact that independent springing has been adopted only on cars that are partially streamlined, while on the radical Chrysler and DeSoto semi-elliptic springs were retained. Tests, it is said, showed that a redistribution of weight in these models obviated the necessity for softer springs.

Hence the door is left open whether, as streamlining gains ground, the simpler semi-elliptic type of front spring will return or whether the coil spring will survive the transition to the new type of body. Chrysler can swing either way, Plymouth and DeSoto having gone to coil springs and Chrysler and DeSoto still using semi-elliptic ones.

A further complication, several years distant, is whether 100 per cent streamlining and locating the engine at the rear will reopen the entire question after the present flurry is settled.

Meanwhile, makers of semi-elliptic springs, most of whom have refused to expend large sums for redesigning their plants for coil springs, maintain that by using more and thinner leaves, beveling the edges and tapering the ends, they can match the riding qualities of coil springs at a lower cost and with a less complicated front end.

SURMOUNTING all production obstacles and market handicaps, the outlook for 1934 business has daily grown brighter.

Especially considering that some producers will not be in full swing before February, and some not until March, the general claim is made that the only limit on the industry in the first half year will be its capacity to produce. In other words, all the automobiles that can be made in the first half year can be sold.

Not only during the remainder of January, but also probably through February, production schedules will be meaningless. It will be a matter of running production up as fast as possible, rather than trying to adhere to a schedule.

At the outset of 1934, forecasts in Detroit for the year's output of passenger cars and trucks, not including Canada, ranged from 2,600,000 units to 3,500,000. Now, most minimums are 3,000,000. By comparison,

output in 1933 was 2,000,000, in 1932 it was 1,200,000, in 1931 it was 2,400,000, and in 1930 3,350,000.

Last January, assemblies totaled 130,044 units, and because of delays this month will show little, if any, increase. Last February, when Detroit opened the series of banking holidays, assemblies declined to 106,825. Assuming production difficulties are overcome, February this year should double last year. And indications point to March being a still better month.

Chevrolet, operating three 8-hour shifts, last week crossed 1000 units daily on the way up. Buick is maintaining operations on the basis of a 9000-car month. Packard is completing a schedule of 800 for this month, and Graham just under 1500.

Few deliveries of the new Chryslers and DeSotos will be made before March, and distributors in some cities are embarrassed when prospects ask to see under the hood, because there is nothing there. The small Olds will not be seen in the streets in numbers prior to March. Plymouth and Dodge assemblies are just getting under way.

Steel shipments to Detroit in January will be less than half the tonnage of December, and orders are far under the December level, due of course to the bulge at the end of the quarter and the delays in production.

Chrysler, Chevrolet, Pontiac and Buick issued substantial orders last week, chiefly for sheets, but in some cases did not release these orders. Most automotive users are consuming their inventories first,but these are unbalanced. Sheet mills are the most active of all steel departments catering to the automotive trade, and the Detroit and Monroe mills are operating 80 per cent or higher. Numerous orders for drop forgings have been placed. Chrysler last week ordered considerable cold-finished stock for coil springs.

Steel more than any other material has benefited from the mechanical and body changes of 1934. On the average, cars are 200 pounds heavier this year, and this additional weight is chiefly steel. The truss-like frame of the streamlined bodies require a heavier tonnage; until new jigs were devised, it appeared that the new Chryslers and DeSotos would have to be assembled upside down.

Where frames still are used, they are heavier, with stronger cross members. The new coil springs and independently-sprung front wheels weigh 30 to 40 pounds more than the I-beam axle and semi-elliptic springs they are displacing. The composite body, which Fisher has adhered to while Chrysler and Hudson have been pushing the all-steel body, may be "out" as streamlining gains ground.

FORD, meanwhile, still has an edge of at least a month on his low price competitors. Daily output at Fordson is close to 3000 units, and merchandising efforts continue unabated.

As noted last week, Ford programs will be on the air twice a week beginning about Feb. 1. A plan has been worked out whereby local newspaper advertising will be financed largely by assessments upon dealers in the various distributing districts.

Special representatives of the Ford company are now working with dealers, establishing them in service stations. Neighborhood service, where the Ford agency will be the chief source of gasoline, oil and general repairs, is the goal.

In some large cities Ford agents are leasing desirable locations from established gasoline companies. At present the Ford plan is to take over existing gasoline stations rather than inject new ones in an already-overbuilt market.

Ford orders for additional molds indicate increased activity in the foundry department. At present, all of the cast alloy crankshafts are cast on the outside. There is no activity now warranting expectation of the low price Ford, but an additional model seems likely in spring—if business continues to come back.

The quickening of merchandising efforts by Ford extends to Mr. Ford himself. From being almost a recluse so far as sales effort is concerned, he has blossomed out. Recently he has posed with movie stars, received newspaper men, used the radio to pep up his dealers and has gone so far as to praise NRA. Nothing is more typical of the Ford mentality than this attitude on NRA; after giving every indication of opposition, he now not only is for it but believes it does not go far enough.

Incidentally, personality advertising in the automobile field is increasing. Walter P. Chrysler has been appearing in Chrysler ads, with his associates, such as Zeder, Foy, Fields, Keller and Hutchinson also featured. Mr. Ford, as noted has been noted, has come out of his shell. General Motors is handicapped when it comes to personalities, only W. S. Knudsen and Charles F. Kettering, its "monkey wrench scientist," being widely known.

HUDSON claims that the rear end and side form of a car is three times as important as the front end in cutting down air resistance. Placing its spare tire in the enclosed luggage vestibule at the rear has increased the top speed of Hudsons and Terraplanes 3 miles per hour . . . . Chrysler set a new high production record in 1933 despite the depression. It assembled 448,697 units, against 448,225 in 1929. The 1932 output was 222,602 units . . . . Chrysler has greatly strengthened its engineering staff the past year by picking up men released by competitors under the stress of economy.

Scrap Group Sets Up Code Authority

(*Concluded from Page* 13)

Daniel Roblin, Buffalo Housewrecking & Salvage Co., Buffalo.

Sessions were directed by Herman D. Moskowitz, L. Schiavone & Bonomo Bros., Jersey City, N. J., president of the institute. He was accorded an ovation and a rising vote of thanks by the convention for his services during three of the most difficult years the institute has had to face.

Predicting a shortage of acceptable grades of scrap during the next ten years, Lewis B. Lindemuth, consultant to steel mills on scrap problems, declared that the steel industry would be compelled either to use more pig iron or find uses for cheaper grades of scrap, the latter requiring revisions in open-hearth practice. He stated that, metallurgically, heavy melting steel scrap is equal in value to pig iron.

New Directors Are Chosen

Nine members were elected to the national board of directors of the institute, to serve three-year terms. They are: Mr. Luntz, Mr. Kiley, Harry Silverstein, Midwest Steel Corp., Charleston, W. Va.; Myron A. Cohen, M. H. Cohen & Son Co., Cleveland; Barney Rubine, Hudson Iron & Metal Co., Bayonne, N. J.; I. W. Solomon, Pittsburgh; Ben Kaplan, M. S. Kaplan & Co., Chicago; Dave Pollock, Pottstown, Pa.; and David H. Cohen, D. H. Cohen Inc., St. Louis.

Directors on Jan. 18 elected Mr. Claster president of the institute, succeeding Mr. Moskowitz. They also chose five vice presidents: Ben Cohen, of Louis Cohen & Son, Wilkes-Barre, Pa., and Messrs. Luntz, Silverstein, Rubine and D. H. Cohen.

Walter Erman, of Erman-Howell & Co., Chicago, Ill.; and Thomas F. Kelly, of Brooklyn, N. Y., were re-elected secretary and treasurer, respectively. Philip W. Freider, of the David J. Joseph Co., Youngstown, O., was re-elected chairman of the board of directors.

Benjamin Schwartz, director general of the institute, was re-elected to that office for 1934.

Metal Show in New York

American Society for Metals, formerly American Society for Steel Treating, announces that its sixteenth annual National Metal exposition and congress will be held in New York, Oct. 1-5. The exposition will be located in Commerce Hall in the new Port of Authority building, where 165,000 square feet of exhibit space is available on one floor.

Industrial Men in the Day's News

George C. Lloyd, Retiring Secretary, Iron and Steel Institute of Great Britain

Educated in England and Germany, he served as sea-going engineer in the early days of this century.

In his 25 years with the institute, he has witnessed a realignment of the steel industry in Great Britain.

He has promoted internationalization of the institute with resultant world-wide recognition of its work.

FOR over a quarter of a century at the helm of the Iron and Steel institute of Great Britain, George C. Lloyd, now retiring, has carried the work of the institute forward over the peaks of prewar prosperity and later through the depths of world depression. Furthermore, in this interval he has seen control of the British steel industry pass from the hands of its founders and pioneers, all practical steelmakers, into the new generation of executives whose forte is administrative genius rather than practical knowledge of steelmaking processes.

Born in 1861, Mr. Lloyd received his education in England and Germany. Subsequently he was employed as apprentice with Robert Stephenson & Co. Ltd., locomotive builder. He then spent seven years as a sea-going engineer, later returning to Great Britain where from 1898 to 1900 he was associated with the Wellman-Seaver company.

In 1901 he joined the Iron and Steel institute as assistant secretary. He was appointed secretary of the Institution of Electrical Engineers in 1904, but returned as secretary of the Iron and Steel institute in 1908 upon the death of the former secretary, Bennett Hooper Brough.

Since its organization in 1869, the institute has had only four secretaries—Mr. Lloyd, Mr. Brough, James Stephen Jeans and the founder—John Jones.

When Mr. Lloyd assumed the secretaryship, the steel industry in Great Britain comprised upward of 100 independent units of production, all enjoying profitable operations, unharassed by the fierce competition which later developed. Carried to undreamed-of prosperity by events of the World war, the industry cracked precipitately in postwar years.

Since 1921 the path of the steel industry in England has been a hard one, with consolidation and concentration greatly reducing its scope and making doubly hard the work of a technical institute. However, the international character of the Iron and Steel institute has worked to its advantage, and the presentation and discussion of an ever-increasing volume of research papers has aided in no small degree the development of special steels and alloys now so universally used.

In postwar years, activities of the institute, under Mr. Lloyd's direction, have been broadened through the work of two research committees, one investigating the heterogeneity of steel ingots, the other dealing with problems of corrosion. Both work in conjunction with the National Federation of Iron and Steel Manufacturers. Reports of these committees, issued from time to time, have been finding increasing appreciation from metallurgists in all countries.

At the May, 1933, meeting of the institute Mr. Lloyd was presented with a gold watch on behalf of French members, as a tribute to his many years of furthering the work of the institute in France.

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Bethlehem Steel Co. has announced the following promotions in its Bethlehem, Pa., plant:

A. D. Shankland has been named engineer of tests, succeeding A. P. Spooner, transferred to other duties. Mr. Shankland entered the employ of the Bethlehem company in the chemical laboratory in 1914. Through successive steps, he was advanced to superintendent of Nos. 1 and 3 open hearths and Lehigh mills, on Oct. 1, 1928.

S. D. Gladding, superintendent of Lehigh mills, succeeds Mr. Shankland. Mr. Gladding was graduated from Lehigh university and in 1914 came to the Bethlehem company as a cold saw operator in the Saucon plant. He was appointed superintendent of the Lehigh mills on July 1, 1926.

A. C. Cusick, general maintenance foreman of Nos. 1 and 3 open hearths and Lehigh mills, succeeds Mr. Gladding. Mr. Cusick also was graduated from Lehigh university, his first position in the Bethlehem plant being in the engineering department. In 1925 he was appointed master mechanic of Nos. 1 and 3 open hearths and Lehigh mills. On Feb. 1, 1933, he was appointed general maintenance foreman of Nos. 1 and 3 open hearths and Lehigh mills.

R. J. Knerr, assistant combustion engineer, succeeds Mr. Cusick. Mr. Knerr likewise was graduated from Lehigh university and entered the combustion department of the company for a brief time, then through various other positions, finally being made assistant combustion engineer on May 1, 1929.

J. C. Foster has been promoted to assistant combustion engineer. A graduate of Pennsylvania State college, from 1923 to 1928 he was with the American Window Glass Co., coming to Bethlehem in 1928 as experimental engineer.

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Leslie B. Worthington has been appointed assistant manager of the Chicago district sales office of the Illinois Steel Co. He entered the employ of the Illinois company immediately after his graduation from the University of Illinois in 1923. Following an apprenticeship period at the South Chicago works he entered the general sales department, with which he has been identified until his recent promotion.

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Howard Burnish, active in the development of electric welded pipe machinery and formerly with A. O. Smith Corp., Milwaukee, and more recently connected with the designing of the Spang-Chalfant & Co. Inc., mill at Ambridge, Pa., has opened engineering offices in the Vandergrift building, 323 Fourth avenue, Pittsburgh. He will offer his services

to the pipe industry in the design of electric weld mills. His ancestors were long associated with the steel industry in this country, Joseph and John Burnish being instrumental in obtaining American rights for use of the bessemer process, and his father, Beverly R. Burnish, owning patents pertaining to the fabrication of rails and like processes.

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W. Dean Cunnyngham has been appointed representative in the southern territory for A. Milne & Co., with headquarters at the Hotel Patten, Chattanooga, Ten.

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D. J. Almon has been appointed district sales agent for Morrison Metalweld Process Inc., Buffalo, with headquarters in the Paul Brown building, St. Louis.

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James H. Duff, Pittsburgh attorney, has been elected director of Superior Steel Corp., Pittsburgh, to fill the unexpired term of C. E. Tuttle, resigned.

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Edward N. Hurley Jr., president of the Hurley Machine Co., Chicago, has been re-elected president of the American Washing Machine Manufacturers association.

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E. M. Joyce, formerly vice president of the Hammond Bolt & Nut Co., Hammond, Ind., has joined the sales organization of the Champion Rivet Co., Cleveland and East Chicago, Ind.

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H. B. Menardi, mining and metallurgical engineer, has been appointed manager of the mining machinery department of the California Equipment Co., 1426 Santa Fe avenue, Los Angeles.

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Harry W. Haggerty, formerly vice president and general sales manager of the Corrigan, McKinney Steel Co., Cleveland, is now associated with the Newman Iron & Steel Co., Cleveland scrap iron dealer.

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Heber G. Stout, export manager of the Chain Belt Co., Milwaukee, will leave early in February for an eight-month business survey on the Pacific coast, and Philippine and Hawaiian islands.

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Arthur G. Lambert is now representing the West Leechburg Steel Co., Pittsburgh, in Toronto, Ont., with headquarters at 54 Wellington street east. He also represents the Jessop Steel Co. of Canada.

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C. B. Crockett, former secretary of the Industrial Truck association, and more recently a partner in Crockett, Lightner & Smith, New York engineers, has been named sales engineer for the Cleveland Tractor Co., Cleveland, to develop the application of crawler tractors with necessary special equipment to the problem of material moving in industrial plants and for more general purposes in railway use.

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Thomas W. Barnes, until recently vice president of the W. F. Hebard & Co., Chicago, has been appointed member of the Chicago sales staff of Mercury Mfg. Co., Chicago, builder of tractors, trailers and lift trucks.

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Donald MacMurray has resigned as vice president and director of the Acme Steel Co.,.Chicago. C. J. Sharp, assistant sales manager, has succeeded Mr. MacMurray as a director, but no succesor to the vice presidency has been named.

J. V. Honeycutt

Who as announced in STEEL for Jan. 15 has been appointed assistant general manager of sales for the Bethlehem Steel Co., Bethlehem, Pa.

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H. L. Warner has become affiliated with the Philadelphia office of Frank Samuel & Co. Inc., dealer in ores, pig iron, muck bars and iron and steel scrap. He has represented the company for many years in New York.

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H. H. Champ, vice president and treasurer of the Steel Co. of Canada, was presented with a silver service at the annual sales meeting of that company in Hamilton, Ont., in commemoration of his 47 years of continuous association with the company.

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C. J. King has been elected president of the General Regulator Corp., 50 Church street, New York, manufacturer of regulators and combustion control systems. R. A. Wright was chosen vice president; F. H. Plum vice president and secretary. These officers were formerly president, sales manager, and vice president, respectively, of the Smoot Engineering Corp. J. W. Ackley is treasurer.

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C. A. Kral has been appointed assistant general manager of the Steubenville, O., works of Wheeling Steel Corp., having formerly been in charge of blooming, bar, slabbing and continuous strip mills. Freeman H. Dyke, assistant to Mr. Kral, succeeds to the latter position.

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Albert Weber has returned to America after several months' engagement as consulting adviser on foundry matters to the Citroen Co. Paris, France, and will assume active management of the Pontiac Pattern & Engineering Co., Pontiac, Mich.

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J. Guy Griffith has been appointed sales representative in the Pittsburgh district for Ampco Metal Inc., Milwaukee, with headquarters in the Nixon building, Pittsburgh. He will handle the company's complete line, including Ampco metal, aluminum bronzes, beryllium-copper, nonsparking tools and special bronzes.

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Arthur R. Herske, for three years sales promotion manager for the American Radiator & Standard Sanitary Corp., New York, has been named vice president and general manager of sales for the American Radiator Co. Previously for two years he was sales promotion manager for the latter company.

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Fred M. Fuller, assistant general manager of sales for American Sheet & Tin Plate Co., Pittsburgh, has been appointed general manager of sales. J. I. Andrews continues as vice president in charge of sales.

George G. McGlaughlin, assistant manager of sales in the Cincinnati office of the company, has been appointed assistant general manager of sales at Pittsburgh, succeeding Mr. Fuller.

Walter C. Carroll, identified with the general sales office of the company in Pittsburgh, has been appointed manager of sales at New York, succeeding A. J. Thomas, transferred.

W. Arch Irvin, assistant to the vice president, has been transferred from the operating to the sales department of the company.

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S. M. D. Clapper, formerly chairman of the General Refractories Co., Philadelphia, has been chosen president, succeeding John R. Sproul, resigned. The office of chairman has been abolished and Mr. Sproul has been named assistant to the presi-

dent. Mr. Sproul also has resigned as director.

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R. F. Tillman has been elected president of the Industrial Steel Casting Co., Toledo, O., succeeding Joseph L. Tillman, whose death was noted in STEEL for Jan. 15.

Joseph L. Tillman Jr. has been elected secretary and vice president in charge of plants and production.

C. C. Smith, vice president, has been made director of sales and sales promotion.

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R. B. Nichols has been appointed sales representative in the Chicago district for the Bantam Ball Bearing Co., South Bend, Ind., with offices at 1835 East Seventy-eighth street. He formerly represented the company in southern Indiana and southern Ohio.

E. T. Cobb, formerly with the Western Electric Co., Chicago, has been appointed representative for the Bantam company in the sale of industrial ball and roller bearings in Tennessee.

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O. W. McMullan has been appointed chief metallurgist of the Timken-Detroit Axle Co., Detroit. Graduate of the University of Michigan, Ann Arbor, Mich., for the past nine years he has been assistant chief metallurgist in charge of research and improved practice at the Timken company. He is the author of six textbooks on heat treatment and metallurgy, and has presented numerous papers before meetings of the American Society for Steel Treating.

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Clinton L. Bardo, president of the New York Shipbuilding Corp., has been elected president of the National Association of Manufacturers, succeeding Robert L. Lund, St Louis, who becomes chairman of the board.

George H. Houston, president of the Baldwin Locomotive Works, Philadelphia; Charles R. Hook, president of the American Rolling Mill Co., Middletown, O.; and E. C. Heidrich Jr., president of the Peoria Cordage Co., Peoria, Ill., were chosen vice presidents of the association. Henry Abbot, president of the Calculagraph Co., New York, was elected treasurer; Noel Sargent was named secretary.

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Frederick M. Feiker has been appointed executive secretary of the American Engineering council, with headquarters at 744 Jackson place, Washington. He has been successively assistant to the secretary of commerce, operating vice president of the Society for Electrical Development, managing director of the Associated Business Papers Inc., and director of the bureau of foreign and domestic commerce of the department of commerce. In his new position he succeeds Lawrence W. Wallace who, after 13 years of service, has resigned to become vice president of the W. S. Lee Engineering Co.

John F. Coleman, consulting engineer, New Orleans, was elected president of the council, succeeding W. S. Lee of Charlotte, N. C.

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W. C. Scott Jr., Seattle, effective Jan. 1 was named sales representative of the Phoenix Iron Co., Philadelphia. He is also representative in Washington, Oregon and northern Idaho for the Worth Steel Co., Claymont, Del.; A. M. Byers Co., Pittsburgh; Globe Steel Tube Co. and Globe Stainless Steel Tube Co., Milwaukee; Superior Sheet Steel Co., Canton, O.; and Hanover Wire Cloth Co., Hanover, Pa. He first went to the Pacific coast as sales representative for the Midvale Steel & Ordnance Co. in 1916 and when this company was acquired in 1923 by the Bethlehem Steel Co. he was appointed manager of sales in the Pacific northwest. He resigned this position early in 1933.

Died:

L. B. NUTTING, 62, president, Foster-Wheeler Corp., New York, manufacturer of power plant equipment, Jan. 12. Born in Lansing, Mich., in 1893 he became associated with Henry R. Worthington, founder of the Worthington Pump & Machinery Corp., going to Hawaii on research work. In 1900 he joined R. D. Wood & Co., Philadelphia, and three years later was appointed sales manager and a director of the Power Specialty Co., New York. Later he became president and when, in 1927, the company was merged with the Wheeler Condenser & Engineering Co. into the Foster-Wheeler Corp., he continued as president.

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Joseph W. Wilkens, 55, secretary-treasurer, Claffey Casting Co., Waukesha, Wis., Jan. 11.

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Frank Work, 70, a director of the Wheeling Steel Corp., in Steubenville, O., Jan. 14.

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Charles A. Fritz, plant construction engineer for the Aluminum Co. of America, in New Kensington, Pa., Jan. 13.

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Otto F. Alig, 51, president, Model Stove Co., in Louisville, Ky., recently. At one time he was associated with the Home Stove Co., Indianapolis.

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Giuseppe Faccioli, 56, former works engineer and associate manager of the Pittsfield, Mass., works of the General Electric Co., in Pittsfield, Jan. 13. Ill health forced his retirement about four years ago. He spent much of his time in Schenectady, N. Y., in association with work of the late Dr. Charles P. Steinmetz.

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John Heil, 62, works manager, Heil Co., Milwaukee, in that city recently. He was the elder brother of Julius P. Heil, founder and president of the company.

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William A. Obsorn, 64, for many years head chemist of the former Cleveland Rolling Mill Co., Cleveland, Jan. 12. He was a grandson of the late Henry Chisholm, founder of the company.

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Thomas H. Thomas, 62, for many years affiliated with the now defunct Carbon Steel Co., Pittsburgh, and later in the contracting business in Pittsburgh until his retirement in 1926, in Pittsburgh, Jan. 12.

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W. W. Crawford, 66, banker, industrialist and director of the Sloss-Sheffield Steel & Iron Co., Alabama, Fuel & Iron Co. and the Bessemer Coal, Iron & Land Co., in Birmingham, Ala., Jan. 15.

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Raymond K. Egan, former president of the Fay & Egan Co., Cincinnati machine tool builder, Jan. 14. He was known widely for his numerous inventions in the machine tool field.

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Seymour W. Doran, 52, for many years personnel director of the Pratt & Letchwork Co., Buffalo, Jan. 13. He recently had been made director of production for J. R. Young & Co., Buffalo.

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William B. Potter, 70, for a long time the engineer of the General Electric Co.'s railway department and a veteran of electric traction work, in Schenectady, N. Y., Jan. 15. He retired Sept. 1, 1930, after 43 years of service with the company.

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Edward J. Kearney, 65, secretary-treasurer, Kearney & Trecker Corp., Milwaukee, in that city, Jan. 12. He was a leading industrialist of Milwaukee and a prominent figure in the National Machine Tool Builders' association for many years. In 1893 he became a draftsman in the West Milwaukee shops of the Chicago, Milwaukee & St. Paul railroad. After a number of years he joined the engineering staff of the Kempsmith Mfg. Co., Milwaukee, manufacturing milling machines, and in 1898, with Theodore Trecker, a former associate at the railroad shops, organized the firm of Kearney & Trecker.

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Peter J. Gordon, 75, at one time general superintendent of the Republic Iron & Steel Co., Youngstown, O., in Beverly Hills, Calif., Jan. 11. He joined the Republic company in 1900, becoming first superintendent of the bessemer plant.

(*Please turn to Page* 51)

EDITORIAL

Employe Representation Has Opportunities Under NRA

RELATIONS between employers and employes have been an important problem in industrial management for many years. Periodically during the past several decades the subject has been pushed to the forefront by force of some unusual event or chain of circumstances, has held national interest for a brief period, and then gradually has receded to a modest position alongside of numerous other problems of industry—there to remain quiescent until a new impetus brought another revival of interest.

Right now industry is in the early stages of another cycle of heightened emphasis on labor relations. It is quite possible that the developments of this period will transcend in importance everything that has gone before and that they will influence the labor policies of industry for many years to come.

The impetus for the present activity was furnished by the famous Section 7a of the national industrial recovery act. Its provision for collective bargaining became law last June 16. Since its enactment much time has been consumed in wrangling over the real intent of the labor clause. During the seven months of discussion, it was difficult, if not impossible, to study the problem of labor relations in respect to Section 7a calmly and impartially because of the flood of emotional, biased opinion which emanated from certain official and semi-official government sources and which undoubtedly placed undue emphasis upon the role of labor unions under Section 7a.

Worker May Bargain Individually, or, if Collectively, by Method of His Choice

Now that the issues are more clearly drawn, government, management and labor are beginning to grasp the real opportunities and responsibilities embraced in the labor relations clause. Today, for the first time, there is a chance to review the problem broadly and to formulate policies intelligently.

First it is important to recognize several basic facts regarding the official interpretations of the intent of Section 7a. "Employes have the right to organize and bargain collectively through representatives of their own choosing" does not mean that employes *must* bargain collectively. They have the right to do so, but if they prefer to bargain individually, that is their privilege. If they prefer to bargain collectively, they may choose between a labor union, a company representation plan or any other type of organization of their own choosing.

Fortunately for students of the subject, the National Industrial Conference board has just completed a survey showing how industrial companies are dealing with employes. Reports were received from 3314 concerns employing 2,585,740 wage earners or about 27 per cent of all employed in manufacturing and mining industries. The results are summarized as follows:

How Companies Deal with their employes	Number of Companies	Number of Employes	Per cent of Total Employes
Individually	2,284	1,013,016	39.2
Employe representation	653	1,164,294	44.9
Trade union agreement	416	240,866	9.3

The report also shows that since the enactment of NIRA, the number of companies which deal with their workers through employe representation plans has increased 180 per cent and the number of companies which have trade union agreements with their employes has increased 75 per cent. Only 11.6 per cent of the employe representation plans had been introduced before 1920, while 40.9 per cent of the trade union pacts dated back to the war period. Individual bargaining is practiced generally in the smaller companies, averaging less than 500 employes each; trade union agreements are more common in companies of medium size, averaging 800 employes; and representation plans are used generally in larger companies, averaging more than 1500 workers each.

Industry Will Do Well To Explore Possibilities of Plan Under NRA

This report shows the employe representation plan to be a far more important factor than has been indicated in the discussions of recent months. Additional evidence of the latent possibilities of employe representation is furnished by the recent report by Walter C. Teagle, chairman, industrial relations committee, business advisory and planning council for the department of commerce. Mr. Teagle recounts many accomplishments of long-established representation plans, refutes some criticisms against such plans, and outlines opportunities afforded by these plans under NRA. In conclusion he states that employe representation has demonstrated its value as an instrumentality to accomplish industrial harmony.

Now that fanatical attacks against this method of labor relations have subsided, it undoubtedly will come into its own as a useful aid to employe and employer. Industry should avail itself of the opportunities it offers.

THE BUSINESS TREND

Will Dollar Stabilization Aid Heavy Industries?

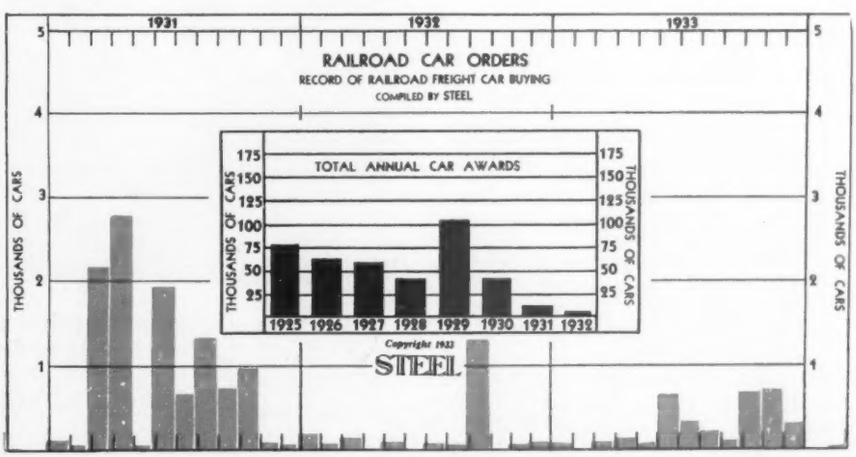
PRESIDENT ROOSEVELT'S message on monetary policy should pave the way for a test of the question as to whether or not the uncertainty of the dollar, which prevailed through the fourth quarter of 1933, was responsible for the lack of activity in the capital goods industries.

Late in the year financial and industrial executives complained that the "dancing" dollar, or rather the absence of authoritative word as to the future monetary policy, prevented business from making long-term commitments, and that this in turn was an obstacle to the return of activity in the heavy equipment and other durable goods industries.

Now that the President has indicated that the devaluated dollar will come to rest at a point somewhere between 50 and 60 cents, and that a stabilization fund will be employed in an effort to keep it there, the "uncertainty" of the dollar no longer can be cited as a factor retarding the capital good industries. After the nation has had time for adjusting itself to the new status of money, one should expect that private funds will be offered in greater volume for investment, and that gradually the machinery for financing plant and equipment will turn more smoothly and more rapidly. If satisfactory improvement in this direction is not manifested soon, then it will be apparent that factors other than the "dancing" dollar were responsible for the plight of the capital goods industries late in 1933.

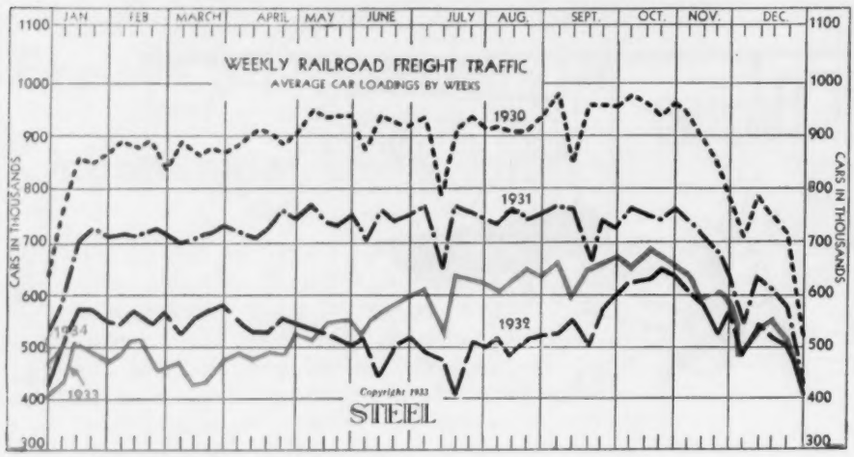
Prices Will Be More Important Factor During First Part of Present Year

In the meantime business continues to improve. The weekly indicators show a steady gain in industrial activity. The clearer definition of monetary policy by the President gave a marked impetus to security and commodity prices. By virtue of this act, combined with the effect of NRA, prices will be in the limelight more and more during the first half of 1934.



1933	
Dec.	316
Nov.	533
Oct.	544
Sept.	23
Aug.	202

1932	
Dec.	50
Nov.	2
Oct.	0
Sept.	1,298
Aug.	5



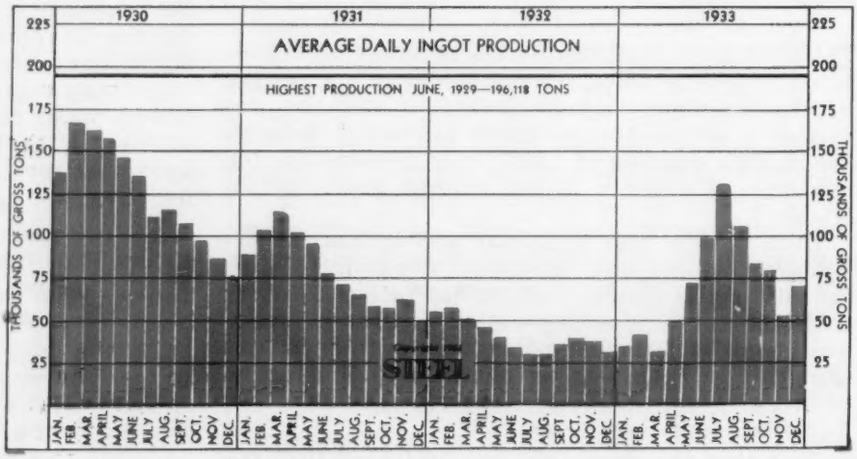
	1934	1933
Jan. 6	499,939	438,847
	1933	**1932**
Dec. 30	450,622	405,301
Dec. 23	527,067	494,510

Freight Movement Advances In First Week of 1934

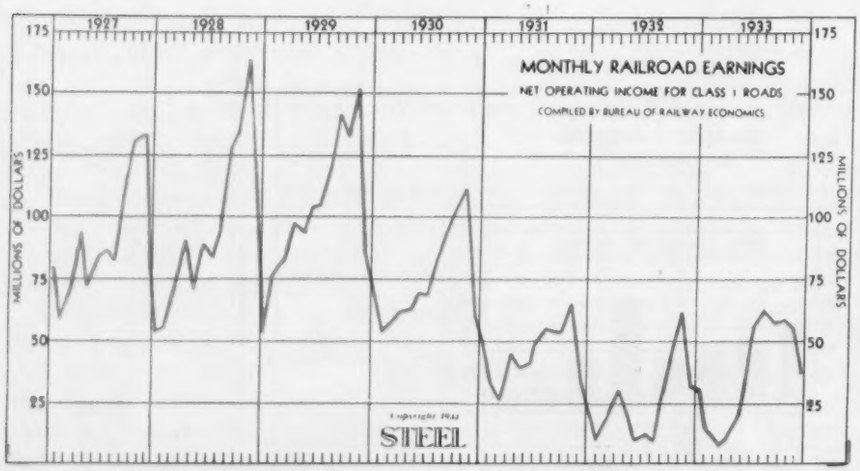
Loading of revenue freight for the week ending Jan. 6 totaled 499,939 cars, according to the report of the American Railway association. This was an increase of 49,317 cars compared with loadings in the preceding week and 60,470 cars above the same week in 1933. While increases were general throughout the list of products, the most pronounced gains were registered in coal loading, which increased 16,089 cars above the preceding week.

Steel Ingot Production Up 71 Per Cent in 1933

The average daily production of steel ingots in December was 72,786 tons, which was at the operating rate of 33.48 per cent. In November the daily rate stood at 59,265 tons while in December, 1932, the daily average was 33,117 gross tons with an operating rate of only 15 per cent. Total calculated output for the entire year 1933 was 22,878,571, or 71 per cent over the 13,322,833 tons of 1932. The daily average for 1933 was 73,801 tons.



December, 1933	72,786
November, 1933	59,264
December, 1932	33,117


1927 1928 1929 1930 1931 1932 1933
MONTHLY RAILROAD EARNINGS
NET OPERATING INCOME FOR CLASS I ROADS
COMPILED BY BUREAU OF RAILWAY ECONOMICS
175 150 125 100 75 50 25
MILLIONS OF DOLLARS
STEEL

November, 1933	$37,565,822
October, 1933	57,264,780
November, 1932	33,396,305

Class 1 Railroads Show Improved Earnings in 1933

Class 1 railroads for November had net operating income of $37,565,822, which was at the annual rate of return of 1.74 per cent on their property investment. During the first eleven months of 1933, class 1 railroads of this country had net operating income of $435,804,479, compared with $294,012,783 during the same period of 1932. Thirty-five railroads failed to earn expenses and taxes in the first eleven months of 1933.

MAKING ENAMELED STEEL TUBS FOR WASHING MACHINES

BY E. F. ROSS
Associate Editor, STEEL

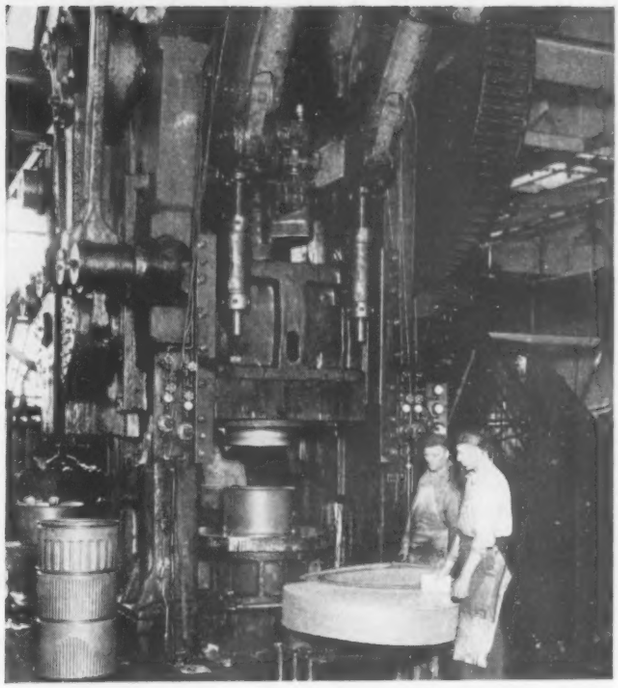


Fig. 1—Washing machine tubs are produced in a single draw in this electrically-operated hydraulic press. A tub just formed is about to be removed from the press and another blank is ready for insertion. At the left are shown three finished tubs with different types of corrugations

GROWING popularity of household electric washing machines in recent years has provided a new and substantial consuming market for steel. Washer parts and assemblies too numerous to mention are made from steel but without doubt the most conspicuous element is the tub itself. When electric washing machines first were introduced, they were equipped with tubs of wood or copper to resist the action of hot soapy water without corrosion; today, however, porcelain enameled pressed sheet steel tubs finished in attractive colors catch the fancy of the housewife.

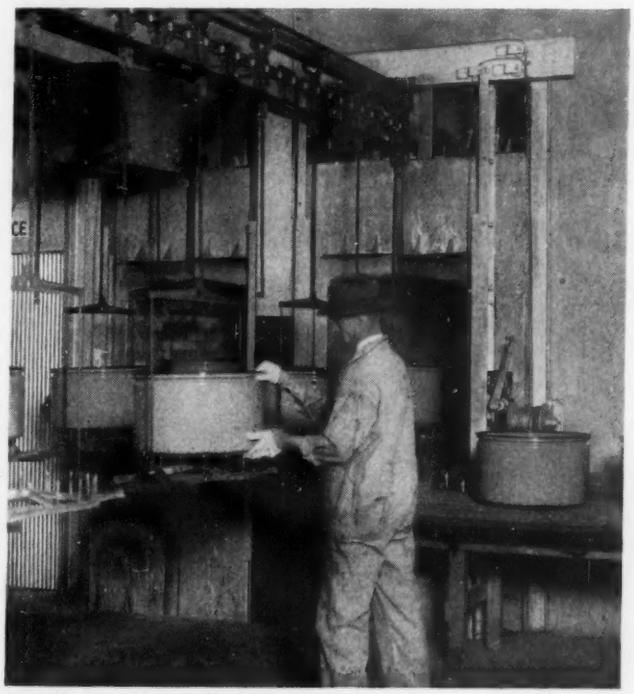


Fig. 2—The continuous electric enameling oven has a capacity for 200 tubs an hour. Tubs enter at the left and emerge at the right after having traversed a path of 160 feet. As they emerge, the operator removes them from the fixture and places them on a rack for transfer to the inspection department

An average washing machine tub weighs about 25 pounds and with sales of washers in 1933 totaling more than 900,000, it is obvious that approximately 11,250 tons of steel sheets were required for tubs alone. Because the production of tubs is highly specialized and involves the use of considerable heavy equipment, most washing machine manufacturers purchase their tubs from outside sources of supply equipped particularly for this type of work.

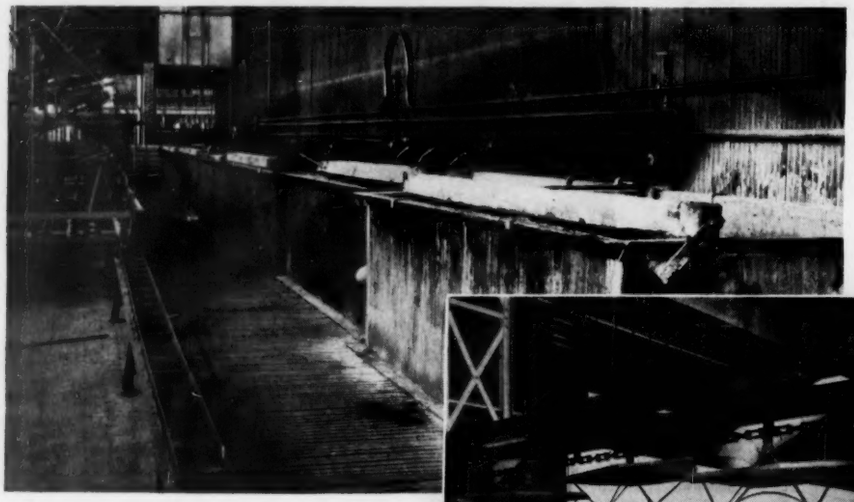
One of the large producers of tubs is the Youngstown Pressed Steel Co., Warren, O., which has modern facilities to manufacture and enamel a wide range of pressed metal products. By virtue of this, the company is supplying 70 different tubs to the country's leading washing machine makers, and has productive capacity for turning out 2400 completely finished tubs per day.

Tubs range from 20 to 24 inches in diameter and from 12½ to 16 inches in depth; spinner tubs, however, within which clothes are spun at high speed to throw off the water, are a little over 12 inches in diameter, but they constitute only about 5 per cent of the output. All of these are produced in a press in a single draw from No. 18-gage deep-drawing enameling stock.

The Youngstown Pressed Steel plant pur-

chases its stock in the form of squares and the first operation is to convert these squares into circles of the proper diameter by means of a circling shear. Dope to serve as lubricant during the drawing operation is applied to the circles by passing them through a pair of felt rolls saturated with a water compound. As they come through the rolls, the circles are deposited on a skid in front of the drawing press.

This press, shown in Fig. 1, is a motor-driven crank-type unit capable of exerting a ram pressure of 3,000,000 pounds. Two workmen operate the press. The operator employs a pair of tongs to place the blank on the press platen. When the press is engaged, the blank is held down around its outer edge and the main ram, working against a backing-up ram in the platen, moves downward to make the draw in a single stroke.



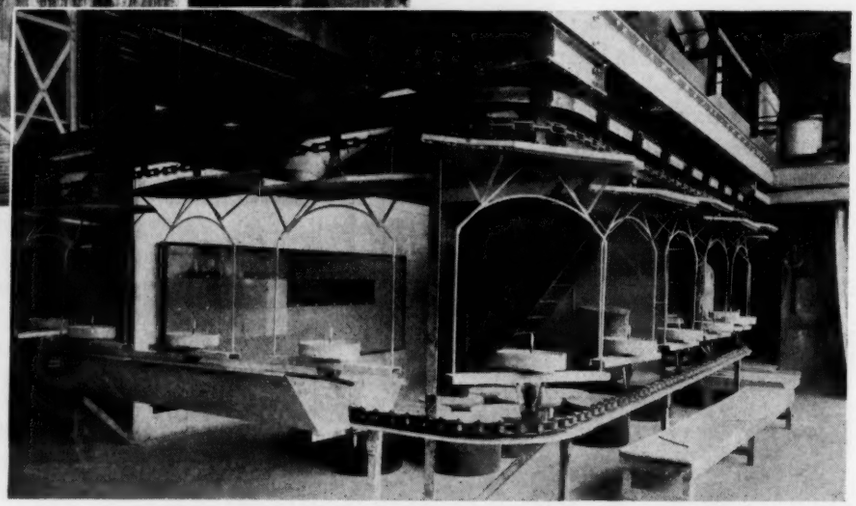


Fig. 3 (Upper left)—A view of cleaning and pickling department. Tubs, 40 at a time, are loaded into one of the monel metal racks shown at the left and are handled through the cleaning, pickle and rinse tanks by a monorail hoist. The drying chamber is shown at the far end of the room. Fig. 4 (Lower right)—Tubs dipped with the ground coat or sprayed with the cover coat of enamel are dried by passing them through the gas-fired oven shown at the left. The last of the series of eight spray booths is shown at the extreme right

Fluted in One Operation

As the main ram ascends after the draw, the backing-up ram raises the tub to the level of the platen, from which position it is removed by the second workman on the back side of the press. Each tub is inspected carefully after the draw to detect any defects developing through drawing of the metal. Some of the tubs are designed with fluted or corrugated sides; consequently tubs requiring this operation are transferred to an adjacent press in which, by an ingenious patented set of dies, all the corrugations are formed by a single stroke of the press ram. Tubs having three different types of corrugations are shown in Fig. 1.

The next operation for the tubs, whether plain or corrugated, is to trim the top flange so that the lip is of uniform width. Holes are pierced in the bottom, one in the center for the vertical spindle which operates the washer agitator and another near the side wall for the drain cock to be attached. The tub is passed to another machine for the top edge to be given a beading operation; then follows a curling operation which produces a smooth, neat-appearing roll edge. Wringer holes are pierced in the side wall as required. At this point, the tub is completely fabricated, ready for final inspection.

As the tubs pass inspection, they are suspended on an overhead conveyor which transports them out of the pressed metal department to a stockroom or to the enameling department in an adjacent building. Tubs which go to the enameling department are removed from the conveyor as they arrive and are stacked on the floor to await cleaning and pickling. The Youngstown company maintains an even flow of production and makes maximum use of its pickling and enameling equipment by scheduling all of its cleaning, pickling and enamel ground coat work to be done by the night shift and all cover or finish enamel work by the day shift.

The pickling department is shown in Fig. 3. Its equipment consists, in order of sequence, of two cleaning tanks for removing oil and grease, a rinse tank, two pickling tanks, another rinse tank, a neutralizing tank and a drying chamber. The tubs are loaded on their sides in an acid-resisting metal pickling rack having a capacity for 40 tubs and are treated in sequence in the cleaning solution, rinse water, pickling acid, rinse water and neutralizing bath. Two of the pickling tanks in this installation are rubber lined, being furnished by one of the leading rubber companies. From the illustration, Fig. 3, it will be noted that the pickling racks, when not in use, are supported above the floor level on a roller conveyor on which they may be moved freely. The racks are lifted from this conveyor and handled through the various tanks by an overhead monorail hoist.

Dried Before Enameling

As the tubs leave the pickling department at the opposite end from which they enter, they are dried thoroughly by placing the rack on a roller track and pushing it into a chamber equipped with lift doors and heated by steam coils. This chamber is shown in both Fig. 3 and Fig. 5. After remaining in this chamber for the required time, the loaded rack is pushed into the enameling department, where the tubs are removed and suspended on an overhead chain conveyor.

Moving forward on this conveyor, each tub is dipped into a tank of ground coat and replaced on the conveyor to pass immediately through a continuous gas-heater dryer where the surplus moisture is evaporated. This oven is shown in Fig. 4. From the drying oven, the tubs pass through a continuous electric furnace of horseshoe type in which they remain for 30 minutes, during which time the

ground coat is baked thoroughly. This furnace is shown in Fig. 2. As the tubs emerge from the furnace, they are removed from the conveyor and placed on racks ready for the day shift to apply the cover coat of enamel.

Workers on the day shift transfer the tubs from the racks to a continuous overhead chain conveyor passing to the line of spray booths. Eight booths or stations, such as shown in Fig. 6, are provided and the conveyor makes a series of U-shaped loops in such a manner that a spray gun operator in each booth has a semicircular working range and thus has ample time to spray each piece before it passes out of reach. The fixtures upon which the tubs rest have mechanically revolving bases so that the tubs turn slowly as they pass through each booth, thus assisting the operator in applying the cover coat evenly.

Booths Lighted, Ventilated

Each booth is well illuminated and is equipped with a mechanical draft system to suck up and exhaust the sprayed enamel not striking the tubs, thereby preventing the operator from inhaling it. Cover coat enamel is prepared on a balcony at one end of the enameling department and is supplied to the spray booths through a system of piping. Each operator has a specific portion of the tub to spray, for example, one will apply the enamel to the inside, another to the outside, and so on. Some tubs are given an additional spray to provide the multitude of small white specks—this is known as spreckling.

With the spraying of the cover coat completed, the tubs pass for a second time through the gas-fired drying oven, shown in Fig. 4, to have the surplus moisture evaporated. Emerging from this drying treatment, operators use small pads and brushes to wipe the top bead of the tub and the edges of bottom holes and wringer holes free from the cover coat. This wiping is done to provide more perfect seats for the water-tight gaskets which are used in attaching the tub to the washing machine frame and wringer.

Fig. 5—Looking through the steam-heated drying chamber into the pickling department. After being dried, the rack loaded with tubs is pushed into the enameling department

At this point, the tubs are ready to be transferred from the spray line conveyor to the electric furnace conveyor to pass through the furnace for fusing of the porcelain enamel cover coat. This furnace, through which the tubs previously passed during baking of the ground coat, has a rating of 600 kilowatts and a capacity for 200 tubs per hour. It was built by one of the country's largest manufacturers of electrical equipment.

This furnace is shown in Fig. 2. Work enters on the left-hand side and emerges through the adjacent door at the right. The furnace is 80 feet long and, as stated previously, is of horseshoe type, therefore work passing through it travels a distance of 160 feet. Three zones of heat are provided; the first, 65 feet long, serves to bring the tubs up to heat; the second, 30 feet long, and automatically maintained at a temperature ranging between 1640 and 1660 degrees Fahr., fuses and bakes the porcelain enamel; and the third zone, 65 feet long, cools the tubs down so that as they emerge from the furnace they can be removed by hand from the conveyor. Temperature control apparatus is installed in a small room at the left of the furnace.

Complete Inspection Given

As the tubs are taken from the furnace conveyor they are placed on wooden racks to await final inspection in a department set up for this purpose just to the right of the furnace. Fig. 7 shows a view of this department. Tubs are scrutinized carefully for defects after which they are placed in individual boxboard cartons ready for shipment to the washing machine manufacturer. Packaging of the tubs in this manner insures their delivery in first-class condition.

One of the features of the Youngstown Pressed Steel plant is its extensive and efficient system of conveyors for handling the tubs throughout their various stages of manufacture. More than a mile of conveyors—5700

(*Please turn to Page* 32)

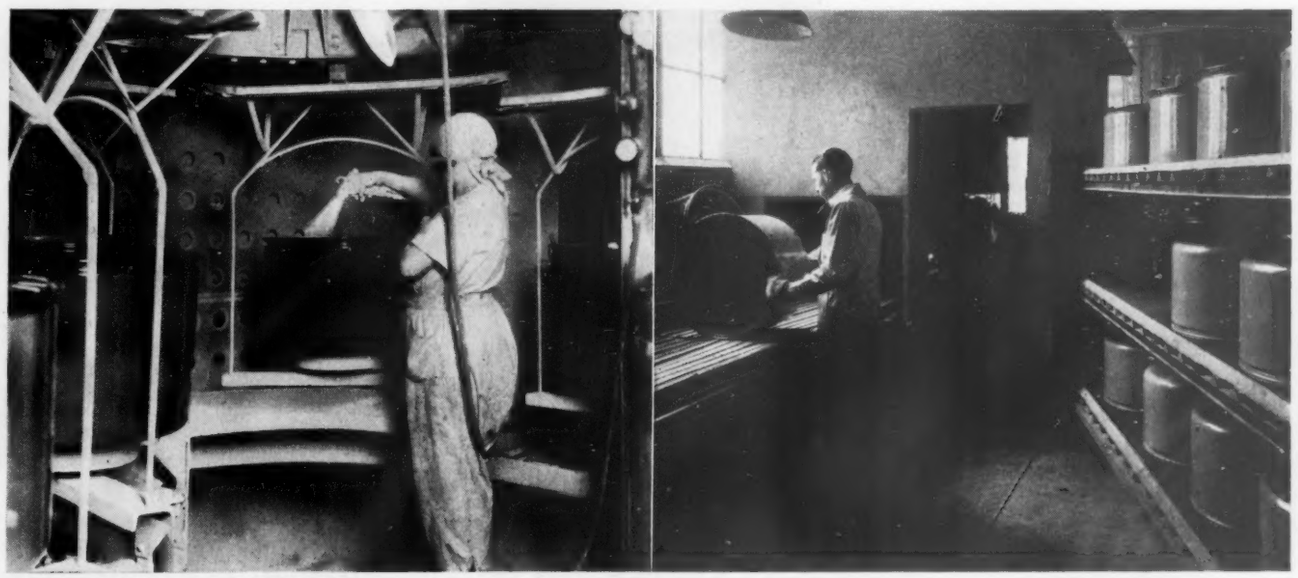
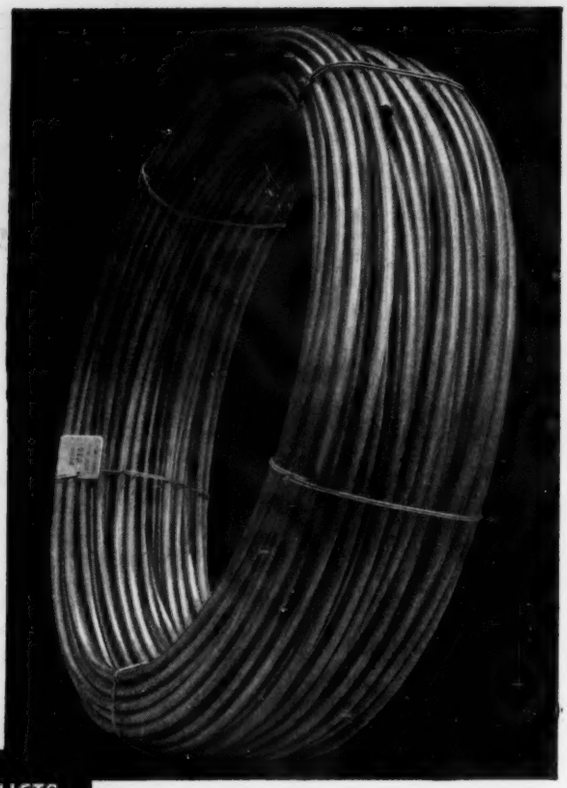


Fig. 6 (Left)—This shows the interior of one of the cover coat spray booths. The tubs move in a semicircular path and are rotated mechanically to simplify the spraying of the enamel. Fig. 7 (Right)—In the final inspection department, the tubs are looked over carefully for all defects. After inspection, they are placed in individual boxboard cartons ready for shipment

THE RIGHT QUALITY OF STEEL IN J&L COLD HEADING WIRE . .



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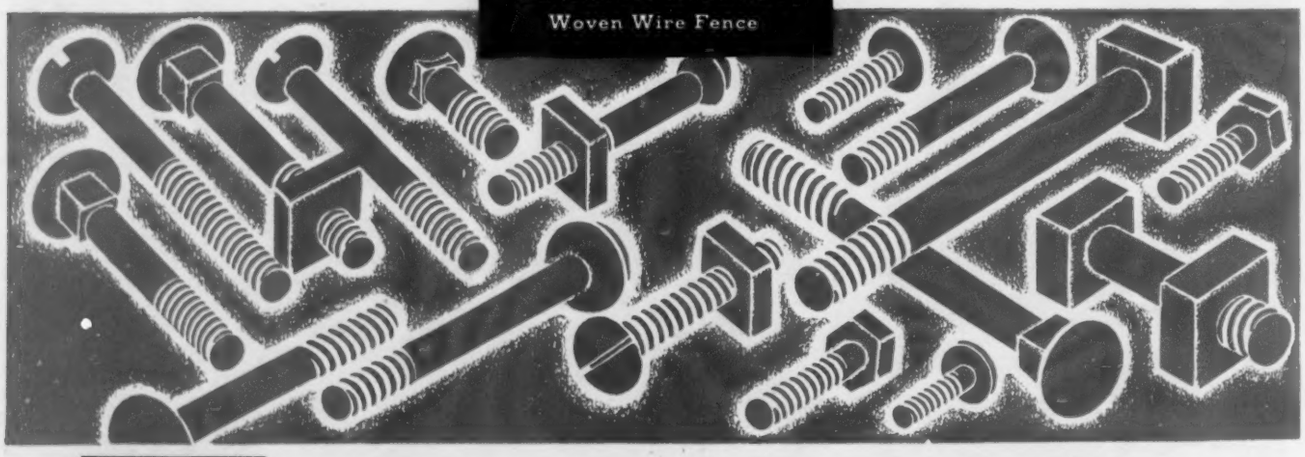

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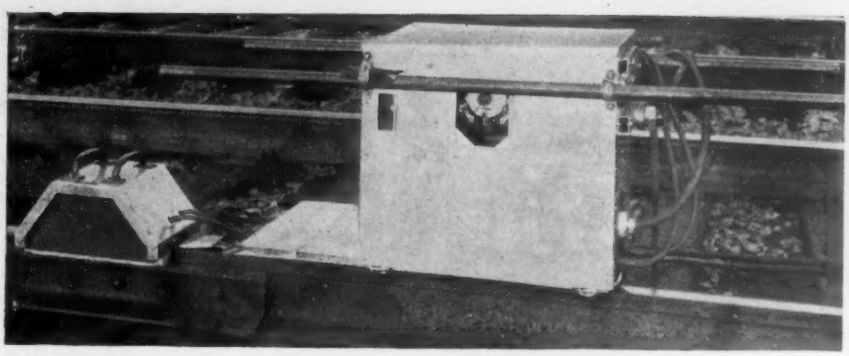


Portable preheater of induction type which raises temperature of rail ends to 600 *degrees Fahr.*

Rail Ends "Sorbitized" in Track To Prevent Batter

PREVENTION of batter of rail ends has been accomplished with heat treating equipment recently placed in commercial operation by the Electric Railweld Sales Corp., Chicago. Details of the process were described at a recent meeting of the Golden Gate chapter of the American Society for Steel Treating, San Francisco, by H. E. Morse, R. E. Frickey and A. S. Kalenborn of the corporation, who were responsible for working out the metallurgical, mechanical and electrical details of the method. The procedure involves the preheating, electric-arc heating, quenching and tempering of the rail in four distinct steps, and results in changing the original pearlitic structure of the ends to a wear-resisting sorbitic structure.

Rails in the 120 to 140-pound class ordinarily contain carbon ranging from 0.72 to 0.89 per cent and manganese of 0.50 to 0.90 per cent. Grain structure is almost completely pearlitic and coarse, while hardness averages about 225 brinell. In addition, the immediate surface is not infrequently decarburized considerably, and the condition is not favorable to resist batter.

Repair Work Eliminated

In repairing rail ends battered from the constant hammering of car and locomotive wheels, it has been customary to cut away the battered portion, apply an overlay of steel by welding and grind down to form. The Teleweld process is more in the nature of a preventive operation, being designed to halt excessive batter of the ends before they reach the condition necessitating the cutting away, overlay and grinding of the section.

Normally, deterioration of rail ends in service develops rapidly at first, is reduced somewhat as the steel work hardens under the constant hammering, but continues at an objectionable rate even after work hardening has taken place. An important aspect of the treatment to prevent excessive batter is to do so in such a way as to eliminate all possibility of the development of incipient cracks likely to produce spalled surfaces under traffic conditions.

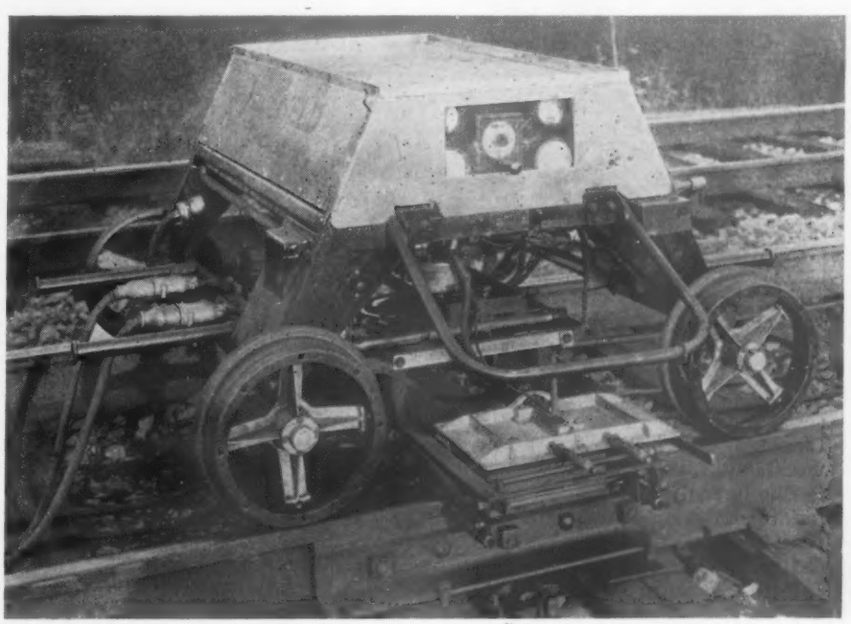
In studying the problem, various possible methods of heating and quenching were tested. Blow torches were discarded as affording unsatisfactory control over the flame. The electrical method was finally found to provide a maximum of uniformity and ease of control. Air quenching was first considered, but the great variation in air conditions from summer to winter, in still air and in wind, and in different parts of the country, eliminated it as unsuitable. Water quenching was considered too severe for a high-carbon, high-manganese steel. Thus the oil quench was chosen as being most suitable.

In carrying out the heat treating, the rail surface is ground for leveling and for the removal of the decarburized area and then preheated. Preheating is accomplished by means of induced, high-frequency alternating electric current and raises the temperature of the rail to 600 degrees Fahr. This is done for the purpose of reducing the temperature gradient in the subsequent arc-heating process and in order to eliminate the variations resulting from attempts to apply the later heating under varying initial temperatures Preheating equipment is shown in an accompanying illustration.

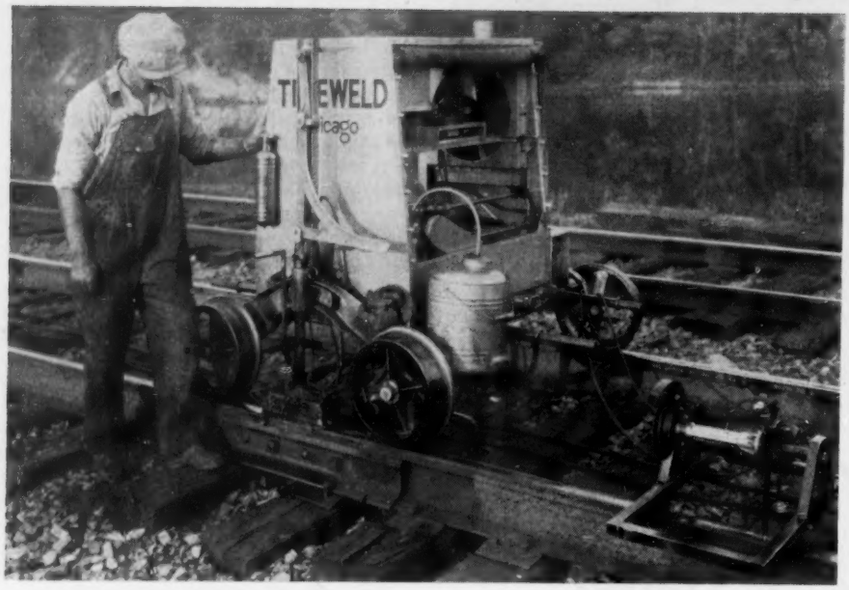
Heated in 2 Minutes

Main heating up to 1600 degrees Fahr. is attained by means of an automatic electric arc in about 2 minutes. Combining the use of a train of gears and a system of cams driven by a motor, as shown in an accompanying illustration, the arc moves rapidly over the rail surface to provide uniformity in heating. The electrode holder is water-cooled.

Quenching is accomplished by means of a separate unit, also illustrated, with which oil is circulated at the head of the rail at a fixed temperature and for a predetermined period. From the final quenching temperature the rail is air-cooled to the atmospheric level, drawing being



Main or electric arc heater, applied to joint after it is preheated, raising temperature to 1600 *degrees Fahr.*



Oil quenching and drawing apparatus which is moved over the joint after the major heating. Quenching rate is controlled to produce sorbitic structure

accomplished with the residual heat under protection of an asbestos blanket.

Action of the oil in the combined quenching and drawing operation is such that brittle martensite is not formed, the steel being held in the hard but tough sorbitic condition, and the hardness being changed from its original 225 brinell to around 425. While each operation is controlled automatically for a definite temperature setting and a definite time setting for heat application, these are varied for the particular type and weight rail being treated.

With the various steps co-ordinated, each unit moves forward from one joint to the next after the same interval of time, and under normal operating conditions an average of 20 joints are heat treated per hour. A separate power plant truck which supplies current to the three primary operations is self-propelled and is used for hauling the equipment.

Joint Committee Proposes Three-Year Program To Correlate Creep Tests

A PROBLEM looming large in the eyes of engineers who design, test and use alloys at high temperatures was discussed at a recent meeting of the joint research committee on effect of temperature on the properties of metals, the agency set up ten years ago by the American Society for Testing Materials and American Society of Mechanical Engineers to deal with the field denoted by its name. The problem is that of short cuts and extrapolations in determining load-carrying ability of metals at high temperatures.

The logical base line for high-temperature design, comparable to the tension test for ordinary temperature design, and like it subject to varying factors of safety dependent on the particular type of service, is the stress for a given amount of deformation, determined by tests, each at one constant temperature and one constant load. This requires a family of curves obtained by long-time creep tests.

In most cases, design can not wait for this accumulation of information, so the designer has to make the best guess he can. Pressure therefore is put on the testing engineer to provide quicker returns.

Either some conversion between long-time and short-cut tests is possible, or none is. Enthusiasm may lead to adoption of an untrue conversion, resulting in disaster on one hand or wasteful use of metal on the other. Conservatism may lead either to excessive cost of testing by sticking to the old ways or to parsimonious failure to make tests where tests are vitally needed.

Correlation of long duration, research type test methods and rapid shop or acceptance test methods was one of the original purposes for which the joint committee was formed and which has had constant consideration. Until recently, the creep determination itself was hardly on a firm enough foundation to serve as a useful base line for comparison.

Therefore, the committee is suggesting a correlation program wherein, as a minimum, one ferritic and one austenitic steel, each most carefully chosen for metallurgical uniformity and stability, would be subjected to creep determination, at a temperature in each case chosen in view of the recognized uses for such materials at those temperatures, and at three loads, chosen to produce creep rates of the order considered allowable in industrial use. These tests would continue for three years and be made under all refinements of the A.S.T.M.-A.S.M.E. code.

Meanwhile, the same materials would be subjected to the various accelerated or short-time methods proposed, and various methods of extrapolation from one load to another that have been suggested, would be applied. From these methods the rate of creep for three years would be predicted according to the procedure used by the proponents of each method, and later compared with actual results of the three-year test. Material would be held for use in other short-cut methods that may arise later, and for possible international comparisons of methods.

Need Industrial Support

Obviously, such a program would involve considerable expense, though the committee already has many promises of co-operation, and the minimum program could not be started without assurance of sufficient interest and support to make its completion certain. That the British joint committee laid out a three-year program independently of the American program is evidence that all investigators realize the need for sustained effort.

Designers and users, as well as producers, of alloys for high temperature equipment, such as power plant, oil, and furnace industries therefore are invited to inform the secretary of the joint committee, N. L. Mochel, Westinghouse Electric & Mfg. Co., Lester Station, Philadelphia, whether they would like to see such a correlation program taken up by the joint committee. The committee desires to be as responsive to the wishes of interested engineering industries as available financial resources will allow.

While its own membership feels that the project should be undertaken at the earliest feasible moment, it seeks comment and guidance on the selection of this or alternate activities which may be deemed more pressing, before it has committed itself to a three-year plan. If the program is not sufficiently welcome, the project will not go forward.

EMPIRE ELECTRICAL SHEETS

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EMPIRE STEEL SHEETS

The Plastic Forming OF Metals

By PROFESSOR DR.-ING. ERICH SIEBEL
Translated by JOHN H. HITCHCOCK

Part II—Forces and Flow of Material in Technical Forming Processes

5. Forming by Means of Drawing

COMMON to all drawing processes is the feature that forming is accomplished by the combination of a tensile force applied to the bar in the longitudinal direction, and of compressive forces in the normal direction which arise as reaction forces in the movement of the bar through the nozzle-shaped die. Inasmuch as the change in length or cross section always comprises the greatest principal deformation of the bar, the condition for the drawing force, Z, in all cases, as derived from equation (26), is:

$$Z = F_1 \times K_f \times \log_e \frac{F_0}{F_1} = F_1 \times \log_e \frac{F_0}{F_1} \times \frac{k_{fm}}{\eta} \quad \text{.....(43).}$$

If a similar condition is assumed to be valid for the longitudinal forces which are exerted upon any cross section, F, of the die, and if it be assumed that these forces are distributed uniformly over all the cross section, equations for the longitudinal and transverse stresses in radial and tangential directions under which forming occurs, considering the condition of plasticity (equation 1), are obtained as follows:

$$\sigma_1 = \frac{Z}{F} = K_f \times \log_e \frac{F_0}{F_1} \quad \text{.....(44a);}$$

and

$$\sigma_r = \sigma_t = \sigma_1 - k_f = K_f \times \log_e \frac{F_0}{F_1} - k_f \quad \text{.....(44b).}$$

The simplest relations exist in the drawing of wire and rod. If the drawn material has a circular cross section, as is ordinarily the case, the deformations in the radial and tangential directions are equal. According to the laws which govern the flow of material (equation 10), the transverse stresses σ_r and σ_t in the radial and tangential directions then also must be equal to each other, and can be calculated according to equation (44b). If the flow hardening due to cold working is temporarily left out of consideration, a stress distribution like that shown in Fig. 68 is obtained for the simple drawing processes. The longitudinal stresses increase from zero at the entrance to a maximum value at the delivery side, according to this distribution, while the transverse stresses decrease in a corresponding manner up to the die exit. The

Stresses Show Increase

stress distribution thus determined probably approaches the actual relations when slender dies are used, and with good lubrication of the drawn material. However, the larger the opening angle of the drawing die becomes, the more justification is lost for the assumption of a uniform distribution of the longitudinal stresses. In fact, it has been shown that the longitudinal stresses increase in this case from the edge to the center of the drawn section. Conclusions regarding the actual stress distribution in the die, as is shown in Part III, can be obtained experimentally by following the course of deformation.

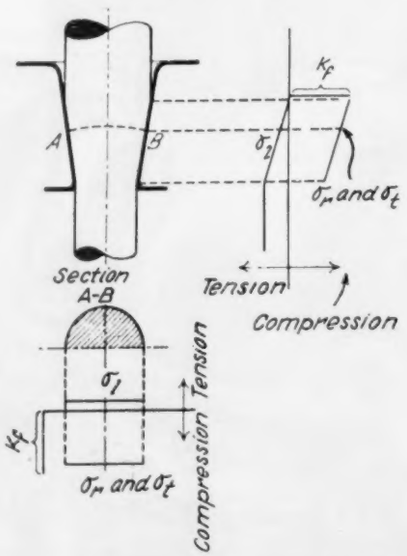


Fig. 68—Distribution of stress in wire drawing

In drawing tubes, also, it is possible to obtain a representation of the stress distribution during the deformation, by the derived conditions. In drawing over a mandrel, the final form of the tube is determined by the opening formed between the die and the mandrel, the mandrel being either a rod which moves with the tube, or a plug which remains stationary. In this process, therefore, a change of the internal diameter of the tube can occur either not at all or only to a slight extent. The reduction of cross section in this case arises instead primarily from a reduction of wall thickness. The longitudinal stress again is given by equation (44a), while the transverse stress in the radial direction corresponds to equation (44b). Because the deformations in the tangential direction are practically equal to zero, the transverse stress in this direction, according to equation (10), must be approximately equal to $\frac{1}{2}(\sigma_1 + \sigma_r)$. The stress distribution represented in Fig. 69 is given for this forming process. The two processes in which tubes are drawn over a mandrel differ from one another only in the frictional relations, which are not determined by the foregoing method of consideration. In the push-bench method, in which the mandrel is a moving rod, the rod moves in the die with higher velocity than the tube, because the displaced material flows opposite to the direction of drawing. The frictional forces, which are produced, relieve the cross section of the tube, because the rod takes directly a part of the longitudinal drawing force. Greater reductions accordingly can be produced in a single draw with this process than by drawing over a plug. In the latter process, however, the tube is given a more uniform wall thickness, by reason of which fact this method of working is preferred for finish drawing.

Streses Are Analyzed

In the so-called sinking method of drawing tubes (drawing without mandrel or plug), the final dimensions of external diameter must correspond to the cross section of the die at the exit. On the inside, however, the tube can be deformed freely in this case; so that the radial stresses on the inner side of the tube are always equal to zero, and even on the die walls under ordinary conditions they can assume no greater values. In this case, therefore, deformation can be achieved only by the effect of the longitudinal stresses produced by the drawing force and the correspondingly greater tangential compressive stresses. These two stress values are given according to equa-

tions (44a) and (44b). From the condition of equilibrium with the forces produced by the tangential stresses, the radial stresses are given by the relation:

$$\sigma_r = \sigma_t \times \frac{x-r}{x} = \left[K_f \times \log_e \frac{F_0}{F} - k_f \right] \frac{x-r}{x} \quad \text{.....(44c);}$$

in which x represents the distance from the tube axis, and r represents the inner radius of curvature of the tube, both measured perpendicularly to the wall of the die. The stress distribution for the sinking process, derived in this way, is shown in Fig. 70. The magnitude of the radial stress always lies between those of the longitudinal tensile stress and the tangential compressive stress. As was explained in the first part of the work, no or little flow of material in the radial direction can occur in this case. This conclusion is confirmed by practical experience. As a rule, the wall thickness remains constant during the sinking process, for tubes of average thickness, while it increases somewhat in thin-walled tubes, and decreases in thick-walled tubes.

Losses Are Separated

The decisive relations for the magnitudes of the force and work requirements in the drawing of wire and rod are investigated in detail.[55] As in all forming processes, losses appear in this case also which can be separated into external and internal forming losses. The external losses can be determined by a comparatively simple computation, if the frictional forces acting on each unit of area in the die are set equal to $\mu \times k_f$, or in other words, equal to the product of the average deformation strength by the coefficient of friction which is assumed to be constant*. Considering a short disk-shaped section of wire, having the cross-sectional area, F, and the length, l of which the middle surface having the circumference, U, is displaced a distance, $d\xi$, by passage through the die from position I to position II (Fig. 71), the work of friction in this operation then amounts to:

$$dA_R = \frac{U \times l}{\cos \alpha} \times \mu \times k_{f_m} \times \frac{d\xi}{\cos \alpha}$$

in which α = angle of inclination of the wall of the die. Substituting $U \times d\xi \times \tan \alpha = dF$ and $l = \frac{V}{F}$ in this equation, the total work of friction in passage through the die is given by the equation:

$$A_R = V \times k_{f_m} \times \frac{\mu}{\sin \alpha \times \cos \alpha} \int_{F_0}^{F_1} \frac{dF}{F}$$

$$= \left[V \times k_{f_m} \times \log_e \frac{F_0}{F_1} \right] \frac{\mu}{\sin \alpha \times \cos \alpha} \quad (45).$$

The expression in brackets, according to equation (20), corresponds to the useful work of deformation. With the small values of the angle, α, which come into consideration, it can be stated that $\frac{\mu}{\sin \alpha \times \cos \alpha} \doteq \frac{\mu}{\alpha}$.

The external losses are directly proportional to the useful work of deformation and to the coefficient of friction, and inversely proportional to the angle of inclination of the die wall.

In contrast to this, the internal losses due to additional displacements of material become the higher, the greater inclination is given to the wall of the die. This can be explained if the conception brought out by P. Ludwik[57] is employed, that the outer shell of the drawn material enclosed by the die is stressed in shear opposite to that of the core corresponding to the final cross section of the wire. The shear stresses thus produced, however, must be the greater for equal reduction, the steeper the die angle is, and accordingly the shorter length of the drawn material is gripped by the die. As is shown by the investigation reproduced in Part III concerning the course of deformation in technical forming processes, the additional displacements in drawing correspondingly increase to a great extent with increasing die angle. In order to achieve a uniform deformation throughout the entire cross section, it is necessary that the transverse pressure exerted from the die walls act upon a length of the drawn material which is adequate in comparison to the diameter. The nonuniformity of deformation therefore becomes the greater, for equal degrees of deformation, the larger the die angle is.

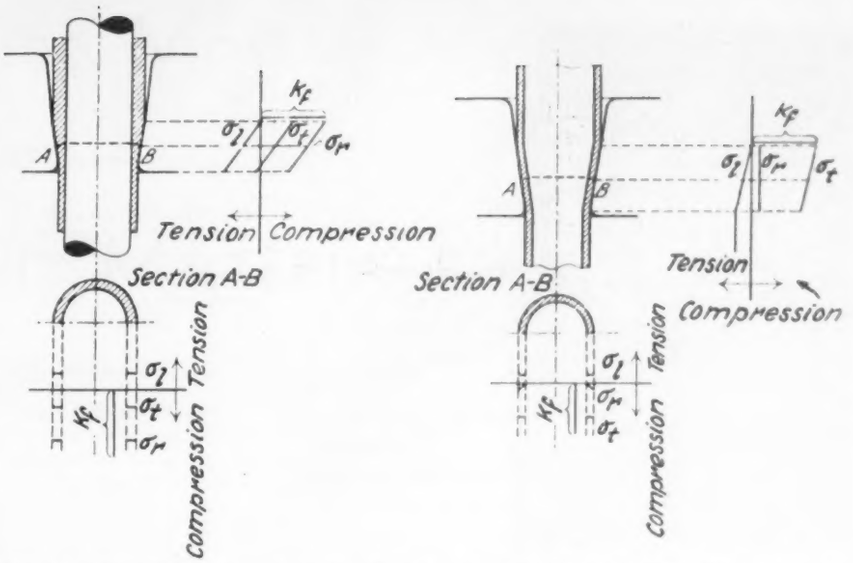


Fig. 69 (left)—Distribution of stress in drawing of tubes (bar-drawing). Fig. 70 (right)—Stress distribution in drawing of tubes (sinking process)

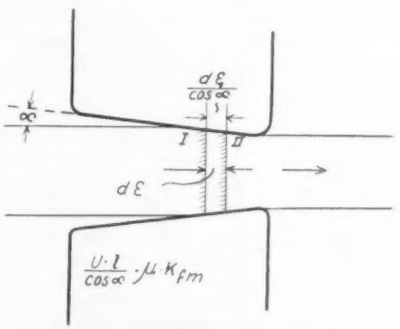


Fig. 71—Determination of friction losses during drawing

Exerts Opposite Effect

According to this, a varying shape of the die, in particular a change in the angle of inclination of the die wall, exerts an opposite effect on the external and internal forming losses, in which the external losses must be influenced to a great extent by the choice of lubricant and by the accompanying change in the coefficient of friction. The distribution of the total work of deformation into useful work and the internal and external losses of energy is indicated approximately in Fig. 72, according to investigations by A.

*Compare previous statements by E. Siebel[56]. A similar calculation, based on the assumption that frictional forces are proportional throughout the area of pressure, was made by G. Sachs[110].

[55] E. Siebel: Ueber die mechanischen Vorgange im Ziehkanal; Zeits. techn. Phys. 7(1926)p.335. See also R. Becker: Ueber die mechanischen Vorgange im Ziehkanal beim Ziehen von Drahten; Zeits. techn. Phy. 6(1926)p.298.

[57] P. Ludwik: Kaltbearbeitung durch Walzen und Ziehen; Z. Oest. Ing. V. 67(1915)p.597.

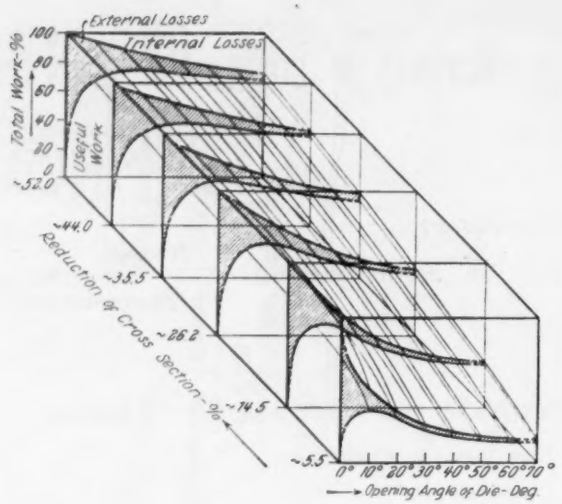


Fig. 72—Useful work and friction work in drawing of steel wires with various reductions of cross section

Pomp and A. Koch[58]. For each reduction and each lubricant, with the individual materials, there must be a most favorable die angle, with which the forming losses reach a minimum or the deformation resistance becomes most favorable.

The influence of the die angle was probably first investigated by H. Gewecke[59], but the few tests which were carried to completion provided no satisfactory explanation. Much more comprehensive are the investigations which L. Weiss[60] carried out in a testing machine, accordingly with much smaller drawing speed, in which copper and brass wires were drawn with varying die angles and reductions. By means of the results achieved, the dependence of the deformation efficiency upon the die angle and the elongation can be represented for copper in the form of a space diagram. The results are not directly comparable with the test values given below, because the deformation efficiency in the case of Weiss' tests is determined in a different manner. Moreover, there is a question to what extent the results of these tests can be applied without modification to practical drawing processes, in which the speed of drawing is much greater. W. Linicus and G. Sachs[61], as well as A. Pomp and A. Koch[58], have attempted to dissect the work of deformation during drawing into its components.

Results Are Charted

In Figs. 73 and 74 are reproduced the results of force measurements which were made by A. Pomp, E. Siebel, and E. Houdremont[35] in drawing tests with soft steel wires (designated as steel A), in order to determine the effects of the die angle, the reduction, and the drawing speed on the requirement of force in drawing. The deformation resistance produced under the existing conditions was calculated in these tests as the quotient of the measured drawing force and the displaced area corresponding to the deformation, according to equations (26) and (43), and was plotted in relation to the die angle and the reduction of area. The values refer to tests on a drawbench with a drawing speed of 78.7 feet per minute. Rape-seed oil was used as a lubricant in these tests. As the illustrations show, the deformation resistance drops with increasing reduction, and has a minimum value for all reductions investigated when the angle of inclination of the die wall is about 6 degrees, or when the opening angle of the die amounts to about 12 degrees. With large reductions, slightly larger die angles appear to be still more favorable. The same tests were carried out in a testing machine, with a drawing speed of only 0.20-foot per minute. No appreciable influence of the drawing speed upon the deformation resistance was indicated. This agrees with observations by H. Eickel and W. Heidenhain[62], as well as by R. Giraud[63]. Exhaustive drawing tests by A. Pomp and W. Becker[64], in which the drawing speed was increased up to 1476 feet per minute, show that an increase of the drawing speed produces a small decrease in the drawing force.

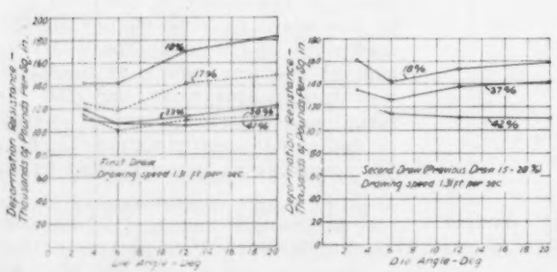
(To Be Continued)

[58] A. Pomp and A. Koch: Uber den Einfluss des Schmiermittels auf den Kraftbedarf beim Ziehen von Flussstahldraht mit Wallramitziehsteinen; Mitt. K. W. Inst. Eisenforsch. 13(1931)p.26.

[59] H. Gewecke: Einige Versuche zur Klarung des Vorganges beim Drahtziehen; Dinglers polytechn. Jour. 325(1910)p.193.

[60] L. Weiss: Der Formanderungswirkungsgrad beim Kaltziehen in Abhangigkeit vom Abnahmeverhaltnis und Ziehwinkel; Z. Metallk. 19 (1927)p.94.

[61] W. Linicus and G. Sachs: Versuche uber die Eigenschaften gezogener Drahte und den Kraftbedarf beim Drahtziehen; Spanlose Formung der Metalle, J. Springer, Berlin 1931; Z. V. d. I. 76(1932)p. 49.


Deformation Resistance - Thousands of Pounds per Sq. in.
First Draw
Drawing speed 1.3 ft per sec
Die Angle - Deg
Second Draw (Previous Draw 15 - 20 %)
Drawing speed 1.3 ft per sec
Die Angle - Deg

Figs. 73 and 74—Influence of die angle and reduction of cross section on resistance to deformation in drawing of mild steel wires

Making Enameled Steel Washing Machine Tubs

(Concluded from Page 25)

feet to be exact—are operated. Their speeds are closely controlled and synchronized so that the product moves continuously without piling up.

Incidentally, the Youngstown company rounded out its manufacture of pressed steel products early last year with the introduction of a line of one-piece porcelain enameled kitchen sinks. These sinks, described in the Aug. 7, 1933, issue of STEEL, are proving increasingly popular. They are finished in acid-resisting enamel and, although of light weight, have great rigidity.

Show Stainless Products

Looking forward to a better year in the sales of canning equipment as a result of heavier packs and fair profits in 1933, the Canning and Machinery Supplies association conducted its annual exhibition in Chicago last week.

A stainless steel conveyor belt, 30 feet long and 24 inches wide, was displayed by the American Utensil Co., Chicago. A juice extractor, a product of the same company, was made entirely of rolled and cast stainless steel. Republic Steel Corp., Youngstown, O., exhibited samples of its various stainless steel products.

[62] H. Eickel and W. Heidenhain; Einfluss von Ziehgeschwindigkeit, Querschnittsabnahme und Kohlenstoffgehalt auf die mechanischen Aigenschaften gezogener Stahldrahte. -Kraftbedarf beim Ziehen; St. u. E. 44(1924)p.1687.

[63] R. Giraud: Contributions a l'etude de l'etriage a froid de l'acier doux; Rev. Met. 25(1928)p.175.

[64] A. Pomp and W. Becker: Kraftverbrauch und Werkstoffeigenschaften beim Ziehen von Sathldraht mit erhehter Ziehgeschwindigkeit; Mitt. K. W. Inst. Eisenforsch. 12(1930)p. 264.

Making the Most *of* METHODS AND MATERIALS

CONFRONTED with the necessity for storing more dies on its available floor space, a manufacturer of metallic caskets erected steel racks in which the principal dies are stored four high with smaller ones placed atop the structure. The heavy dies are necessarily long and unwieldly to handle, weighing up to more than 10,000 pounds. The storage room is 60 x 80 feet with two 16-foot wide aisles running lengthwise. Dies are stored along both sides of each aisle in racks formed of 5-inch H-section columns to which are fastened 8 x 8-inch angles to support ends of the dies. A 5-ton telescoping high-lift electric truck is employed to remove the dies from the rack, to transport them to the presses and to place them in position. Savings realized through this method of storage and handling have proved particularly gratifying. A complete die assembly can be removed and another put in its place in a matter of a few minutes, formerly it was a matter of hours to disassemble and reassemble dies.

$ $ $

A large tractor plant recently installed an automatic boring machine to bore both holes in a connecting rod simultaneously with the wrist pin hole in a piston. The piston is cast iron, the small end of the connecting rod is bronze bushed and the large end is steel, consequently three different materials are bored at one time. It is said that excellent results for finish and accuracy are obtained on all three bores and a large saving is anticipated over previous methods of machining. The steel shows a Rockwell C hardness of 21 to 31 and the large bore is held to tolerances of 0.0002 inch for roundness and straightness and 0.0005 inch for size.

$ $ $

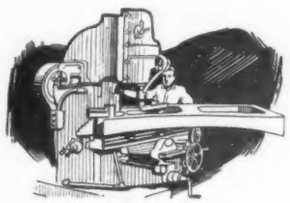
FOR searching out small parts of equipment to be repaired or inspected a peep-hole light is extremely convenient. It enables the repair man to inspect thoroughly the bearings, oil rings and small parts of motors and other equipment without tearing them down. An inexpensive miniature spot light can be constructed from an ordinary fountain-pen type flashlight, attached to a flexible cord and arm in a convenient position over a bench and energized with a small transformer mounted on the wall. The ordinary extension light is cumbersome and cannot be used for getting into the interior parts of small apparatus.

$ $ $

A study of chromium plating, conducted by the bureau of standards in co-operation with the bureau of engraving and printing, of the possibility of depositing chromium from solutions of the trivalent or divalent chromium salts showed that it is not possible to obtain as satisactory deposits or as good efficiencies as from the chromic acid solutions now used.

$ $ $

Nickel-chrome iron dies are used in one large automobile plant for forming such parts as the headlamp shell, radiator shell, ammeter cases, and many other large and small parts, including fenders, body sections, and the like. For these uses, the cast iron has requirements of uniform hardness, high degree of wear



resistance, ease of and uniform machinability, and strong and dense structure. For the smaller parts alloy iron dies containing approximately 2.00 per cent nickel and 0.70 per cent chromium are heat treated by oil quenching from 1550 degrees Fahr., reheated to 900 degrees and air cooled to a hardness between 286 and 321 brinell. Alloy cast iron has been used for some time in metal forming dies, and in many instances is said to have proved to be better than the costly highly alloyed die steels.

$ $ $

General usefulness and limitation of the spark test for carbon and alloy steels has been studied by applying the test to 280 materials differing in composition. For sorting mixtures of steel of known composition, it is said to be unexcelled.

$ $ $

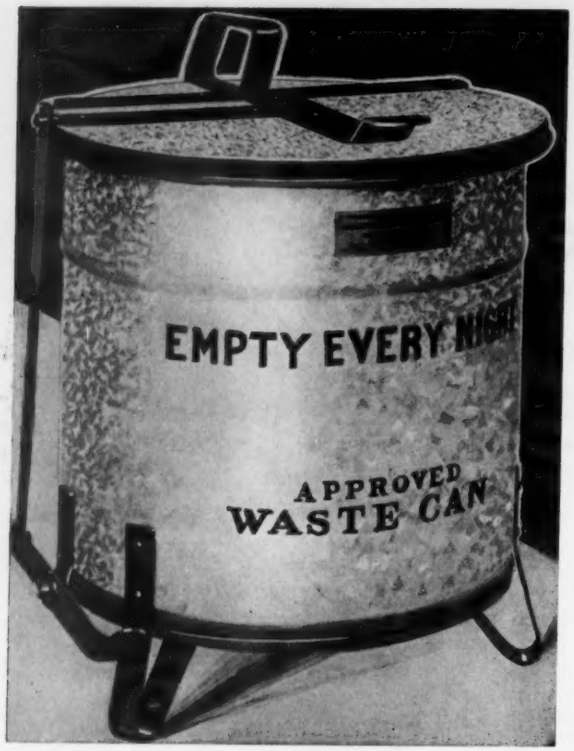
TO SIMPLIFY the task of changing automobile license plates, a manufacturer of lock nuts has introduced a line of fasteners which will not rust. These fasteners are cadmium plated, are automatic self locking but are easily removed. No washers are employed.

$ $ $

A process for oxidizing and coloring aluminum and its alloys consists of a two-stage treatment. The first is an electrochemical oxidizing treatment producing a hard finish which is said to be nontarnishing, noncorrodable and nonporous, and which also can be used as the base for the desired finish. The second stage of the treatment is an immersion in the coloring bath which penetrates the hardened oxidized surface to provide a permanent coating.

$ $ $

A most important development in improving oil well sucker rod performance is the production of plain wrought iron rods. These have now been on the market for about three years and service records show that they are of the utmost value in reducing rod failure. In every case, the wrought-iron rods had a far longer life than the steel rods, and a far lesser number of breaks during their service life. In wells where rods actually are destroyed by pitting action, the wrought iron rods do not last any longer than steel rods; but even in such cases less breaks are experienced before the rods must be removed. Outstanding performance of wrought-iron rods under severe service conditions warrants their use in any well in which excessive sucker rod breakage has been experienced.



—*Courtesy George W. Diener Mfg. Co., Chicago*

◆

OILY waste constitutes a serious fire hazard unless proper disposal is made of it. About 50 tons of steel strip and galvanized sheets are used each year in the manufacture of oily waste cans, one type of which is shown here

◆

LARGE USES OF STEEL IN SMALL WAYS

254th Article ◆ Oily Waste Cans

HUNDREDS of thousands of tons of steel in various forms are consumed yearly in the manufacture of different types of containers. These range from the ordinary variety of tin plated can to tremendously large gas and oil tanks, while scattered between are the many sorts of paint cans, refuse containers, oil drums, beer barrels, and the like. While being far from the most important container from the standpoint of steel consumption, oily waste cans occupy a responsible position in many industries in the prevention of fire losses. Their manufacture has accounted for the annual consumption of nearly 50 tons of steel strip and galvanized sheets, it is estimated.

The greatest individual damage from all causes by fire results from matches and burning tobacco, according to the National Board of Fire Underwriters. A cigarette butt, or an unextinguished match, dropped on oily waste has been responsible for millions of dollars in fire losses every year. Oily waste cans, of which the one shown in the accompanying illustration is typical, are designed to receive and to segregate this inflammable material so that it will not be reached by discarded matches or cigarettes before it can be removed.

Somewhat similar in appearance and operation to containers used to receive refuse in the home kitchen, these cans are made in larger sizes. Common types range from 11½ to 22 inches in diameter and from 12 to 25 inches in height, with the weights varying from about 10 to 55 pounds. The lid may be hand operated or, through the incorporation of a pedal, as illustrated, be raised by the foot.

Sheets, Wire, Strip Used

Both the body and the lid of the can are fabricated from 20 to 24-gage galvanized sheets. The lid is made self-closing by the design which prevents its opening past a vertical position. To aid in providing a close fit and to stiffen the lid, a length of wire is inserted around the inside of the rim. The bottom of the can has a double seam.

Three legs are riveted to the bottom, raising the can 4 inches from the floor and providing circulation of air beneath, thereby helping to prevent the possibility of spontaneous combustion. The legs, as well as the foot pedal and lid handle, are made of 10-gage strip steel, while the latter also are riveted securely in place.

Iron and Steel Division To Meet

The Iron and Steel and Institute of Metals divisions of the American Institute of Mining and Metallurgical Engineers each will conduct six sessions during the annual meeting of the institute in the Engineering Societies building, New York, Feb. 19-22. Fifteen technical papers are scheduled for presentation before the iron and steel group and 18 before the metals group. Special features will augment the technical progress.

The scheduled program of the Iron and Steel division follows:

Monday, Feb. 19

AFTERNOON

"Effect of Extraneous Matter in Coal on the Physical Properties of Blast Furnace Coke," by R. P. Hudson.

Tuesday, Feb. 20

MORNING

"Effect of Carbon and Nitrogen Upon the Lattice Parameter of Alpha Iron," by J. L. Burns.

"Studies Upon the Widmanstatten Structure, V—The Gamma to Alpha Transformation in Pure Iron," by R. F. Mehl and D. W. Smith.

"Studies Upon the Widmanstatten Structure, VI—Iron-Rich Alloys of Iron and Nitrogen and Iron and Phosphorus," by R. F. Mehl, C. S. Barrett and H. S. Jerabek.

AFTERNOON

"Observation of the Formation of Martensite in Certain Alloy Steels at Low Temperatures," by O. A. Knight and Helmut Muller-Stock.

"Magnetic Transformation in Carbon Steels During Quenching," by I. N. Zaverine.

"Notes on Diffusions Taking Place in Iron-Silicon Alloys During Heat Treatment," by N. A. Ziegler.

Wednesday, Feb. 21

MORNING

"X-Ray Study of the Action of Aluminum During Nitride Hardening," by J. T. Norton.

"Chromium-Nickel Steels Containing Columbium," by F. M. Becket and R. Franks.

"The Determination of Oxygen in Alloy Steels and Its Effect Upon Tube Piercing," by Newell Hamilton.

AFTERNOON

"Ancient Cast Iron," illustrated lecture by Dr. T. T. Read.

"The Corrosion Problem," Howe Memorial lecture by Dr. F. N. Speller.

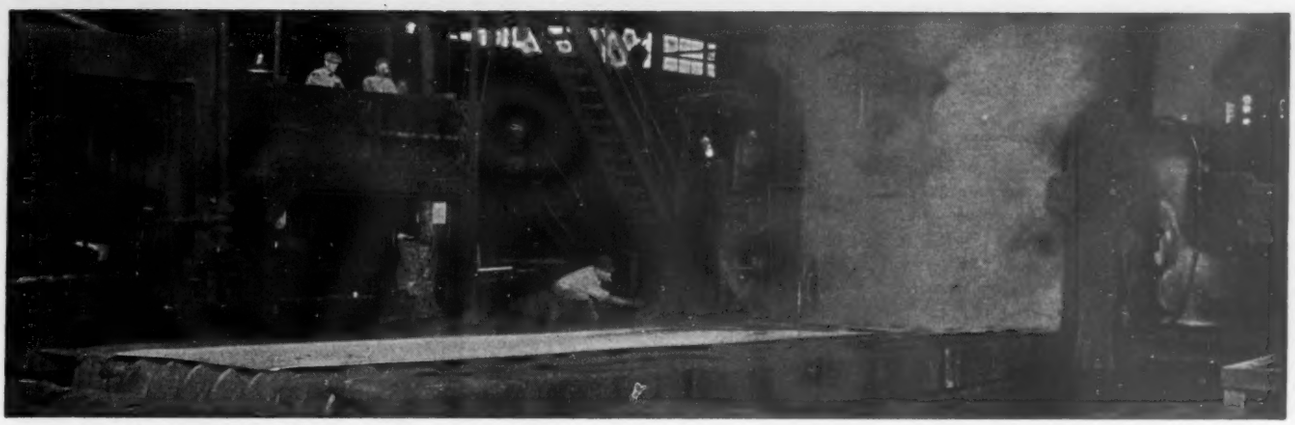
Thursday, Feb. 22

MORNING

"Nonmetallic Elements in Metals," by T. H. Yensen and C. H. Herty Jr.

"Basic Open-Hearth Bottom-Cast Practice and Iron Oxide Control," by W. J. Reagan.

"Critical Studies of a Modified Ledebur Method for Determination of Oxygen in Steel, II," by T. E. Brower, B. M. Larsen and W. E. Shenk.

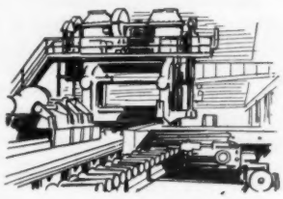


PROGRESS IN STEELMAKING

INTRODUCTION of a motor-operated tap changing switch provides steel makers who employ electric arc furnaces with a means of decreasing the number of oil circut breakers required to control a multivoltage arc.

♦ ♦ ♦

Seamless tubes may be given a high surface finish by first immersing them in sodium silicate and then in a tallow lubricant before cold drawing. The sodium silicate solution usually contains from 3 to 5 per cent water and is maintained near its boiling point.



ROLLING mill tests disclose that about 30 per cent of the power is used in deforming the steel. Overcoming the idle friction of the driving medium accounts for about 27 per cent. Approximately 13 per cent is used in overcoming roll journal friction and 9 per cent in overcoming pinion and spindle friction. About 21 per cent is used in reversing the mill to produce acceleration of the parts. The analysis thus shows that 30 per cent of the total power is productive and 49 per cent is absorbed by friction.

♦ ♦ ♦

Oil hardening steel has been developed for cast-to-shape dies where high resistance to wear is essential.

♦ ♦ ♦

Five steelmakers now are employing an electrically-operated instrument for continuously gaging the thickness of strip as it comes from 4-high tin mills. The unit includes two hardened steel rolls which contact the metal directly, one on the upper surface and one on the under surface of the strip in transit to the reel. The rolls move together or apart depending upon the variation in the thickness of the continuous moving strip. Variations in the gap of the gaging rolls are magnified by an electric circuit and indicated on a microammeter which can be read at a distance of 10 feet. Usually 1½ inches on the scale is equivalent to 0.001-inch with intermediate gradations for each 0.0001-inch. In addition to the microammeter the gage may be supplemented by a photoelectric recorder which affords a permanent record of the variations from the required gage of any continuous inspection. This instrument produces a graphic record on a moving sheet of paper which is synchronized with the strip in the mill.

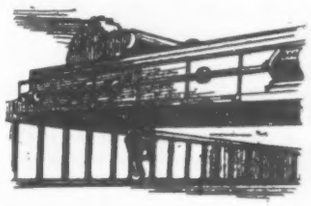
♦ ♦ ♦

Tests of a newly developed circuit breaker for severe conditions encountered in rolling mill service, such as motor starting and jogging, disclose the performance of 10,000 operating cycles of opening and closing 1000 amperes at 6600 volts without any maintenance, reconditioning of contacts or change of oil. The unit is built with heavy arcing contacts and functions on the oil-blast principle.

High finish on the surface of steel sheets may be retained by immersing the sheets for a short period in a dilute solution of phosphoric acid (75 per cent solution by volume. The solution thus applied soon evaporates leaving a film which affords ample protection of the finish while the stock is in transit or in storage.

♦ ♦ ♦

Increasing the ratio of gas to air to effect a change in the combustion atmosphere from one containing a low percentage of free oxygen or a low percentage of carbon monoxide to one carrying 1½ to 2 per cent carbon monoxide has been found to decrease the scaling one-half or more for carbon and alloy steels.



PREVENTING drippage of oil from overhead traveling cranes operated in finishing departments of sheet, strip and tin mills is the purpose of a packing which consists of a cylindrical felt pad. This is held against the journal by clock-spring steel bands and is prevented from rolling by an arrangement of spidered chain links. The packing also is effective in the journals of plant locomotives and larry, transfer, ore and blast furnace stockhouse cars.

♦ ♦ ♦

Cleaning wire and wire rods is best accomplished by using a pickling solution composed of one part hydrochloric acid to two parts water. Freshening up the pickling solution by the addition of new acid is advocated by many wiremakers. Greater production is afforded and drawing practice is more efficient when the wire is cleaned in freshened baths than when subjected to solutions which have not been revived.

NEW EQUIPMENT

PRODUCTION FABRICATION
TREATMENT FINISHING

Milling Machine — Kearney & Trecker Corp., Milwaukee, is building a new rail-type milling machine embodying rigidity, a drive to the spindles that reduces gear contacts to minimize backlash, versatility and ease of control. The unit was developed to use tungsten carbide cutters; however, it can be furnished with optional speed ranges basically suited for other types of cutting metals. Regularly four spindles are furnished, two being of the vertical type mounted on the cross rail, and the other two being of the horizontal type mounted one each on the two side housings. Other combinations may be selected to meet requirements.

♦ ♦ ♦

Trailer Welder—Universal Power Corp., 1719 Clarkstone road, Cleveland, is manufacturing a universal portable trailer welder which features finger-tip control. This unit utilizes the shunt inductor principle of arc stabilization in motor-generator and gasoline engine-driven models with four-wheel trailer mounting. A two-wheel trailer type was introduced some time ago (STEEL, Oct. 24, 1932). An idling control makes it possible to slow down the engine when no welding current is being used.

♦ ♦ ♦

Draft Block—Fletcher F. Milligan Co., 4624 Prospect avenue, Cleveland, is marketing a draft block, or portable drafting tool which can be carried in a brief case for convenient use. It consists of a board and parallel device with drawing attachment in a single compact unit. A choice of two drawing attachments is available; one is a combination of 30-60 and 45-degree triangles, the other is a protractor and graduated straight-edge.

♦ ♦ ♦

Annealing Machine — Selas Co., Eighteenth street and Indiana avenue, Philadelphia, recently brought out an automatic gas-fired annealing machine for spot heating steel parts up to 2 feet in diameter and for work of allied nature. The unit is power driven and carries eight adjustable burners. Rotation of the machine is continuous from left to right, the burners being turned on and throttled down and the baffles moved in and out of operating position automatically.

♦ ♦ ♦

Rotary Shear—Quickwork Co., St. Marys, O., has developed a new rotary shear with capacity to cut 5/16-inch mild steel and flange ¼-inch mild steel and 10-gage alloy steel. The unit will make straight or irregular cuts and square or beveled edges. With an elliptical attachment, it will cut round heads from square blanks, flange round heads, cut elliptical heads struck from four centers, or slit wide sheets or narrow strips from the edge of sheets guiding against the gage mounted in the throat of the machine.

♦ ♦ ♦

Lathe — Monarch Machine Tool Co., Sidney, O., has placed on the market a full automatic lathe employing new principles in construction. It is said to provide simpler and quicker means of changing from one job to another, making it particularly adaptable to small-lot as well as long-run production. The lathe is controlled electrically throughout, employing the principle of magnetic clutches for carriage, tool slide feeds and rapid traverse as well as magnetic clutch and magnetic brake for spindle operation. Limit switches accurately control diameters and lengths of cut.

♦ ♦ ♦

Grinders—Norton Co., Worcester, Mass., announces a line of cylindrical grinders designated type C and built in two sizes, 10 an 16-inch. The 10-inch size is available in standard lengths from 18 to 120 inches while 16-inch machines are furnished in lengths from 36 to 144 inches. A wide variety of arrangements is available including hydraulic table traverse, mechanical traverse and hand traverse models. In addition 10-inch machines are built as semi-automatics, and semiautomatics features can be embodied into hydraulic traverse machines.

♦ ♦ ♦

Box Strapping Tool—Acme Steel Co., Chicago, is marketing a new box strapping tool with automatic seal feed. The device, employed for reinforcing wood and fiber boxes, tensions the strap, applies a seal, seals the joint and cuts the strap from the coil. Operations are controlled from two ball-tipped levers. One hundred seals are contained in a clip, this new feature enabling the strapping to be done with speed and precision.

♦ ♦ ♦

Flexible Coupling—Morse Chain Co., Ithaca, N. Y., recently announced a new flexible coupling in which the flexing member is a complete unit comprising four molded rubber trunnion blocks spaced 90 degrees apart and set under pressure in a two-piece riveted steel housing. The rubber trunnion blocks are provided with steel cores or bushings. Two diametrically opposed blocks are bolted respectively to the armed steel driving and driven flanges on the shafts to be connected.

♦ ♦ ♦

Double-Suction Pump — Morris Machine Works, Baldwinville, N. Y., recently designed a new line of double-section split-case pumps to provide a suitable unit for direct connection to electric motors or steam turbines operating 3500 revolutions per minute. These units may be belt-driven or operated through gears by low-speed drivers such as gasoline engines. Sizes built range from 1½ to 5-inch and are suitable for general pumping duty, factory service, chemical process work, etc.

♦ ♦ ♦

Door Operator—Shoelkopf Mfg. Co., Madison, Wis., is offering a new type of door operator which employs compressed air. The air opens or closes the door half way and then serves, together with a strong spring, as a cushion to effect an easy cessation of movement. Sliding, swinging and folding doors can be operated by this device. The door stops immediately upon striking an obstruction, thus preventing damage.

♦ ♦ ♦

Turbine-Gear Sets—General Electric Co., Schenectady, N. Y., recently brought out a new line of close-coupled, turbine-gear equipment, each set consisting of a steam turbine and speed reducing gear. These units are designed to drive centrifugal pumps, fans, and other relatively low speed apparatus. They are particularly applicable where exhaust steam can be used for heating.

♦ ♦ ♦

Tramrail Switch—Osborn Mfg. Co., Cleveland, is marketing a new tramrail sliding switch which minimizes the necessity for superstructure. Other features include elimination of angular rail cuts, elimination of bending and fitting curves to switch, positive latching, easy rolling carriage and rugged construction. This switch permits the spacing of spur tracks as close as 30 inches.

CONFORMING to its established policy of conciseness, STEEL now presents announcements and descriptions of new equipment in brief but comprehensive form. Full particulars concerning any item on this page may be obtained direct from the manufacturer.

Steel Rate Now Rising on Consumer Demand

Improved Buying Spreading Confidence—Large Automotive Orders Coming First—Fabricators Prepare for Rush—Scrap Up—World Markets Better

WITH increasing support from automotive and general consumer requirements, steelworks operations this week are poised for another substantial rise, after advancing 5 points last week to 35 per cent.

While a considerable portion of current raw steel output in some districts is for stock—in preparation for the heavy finished steel demand makers feel sure is just ahead—operations also are being buoyed by an inflow of new orders from manufacturing industries.

Seldom has there been such a unanimity of opinion as exists now respecting the upward trend of business. Confidence on the part of consumers is being transmitted to producers. A higher volume of buying is noted in practically all districts.

Automotive requirements are breaking through the entanglements incident to mechanical changes in models, and are the first of the important deferred classifications to accelerate finishing mill operations. Releases are coming through more regularly, and have lifted some northern Ohio sheet mill schedules nearly to capacity.

The slow start in automobile production, holding January to little if any excess over the output in the month last year, is backing up a tremendous demand. The only limitation on the industry for the first half now is believed to be its capacity to produce.

Railroad Equipment Awards Await Car Code; Shape Fabricators Prepare for Busy Months

Delays are being encountered in railroad business, largely due to details preliminary to obtaining federal loans. Carbuilders have asked for and obtained an extension of time to get their code approved before bidding on large equipment inquiries.

In rails there is a dearth of new orders, but more action on the part of railroads toward financing their purchases. Santa Fe has placed 6000 tons of track fastenings to accompany its recent order for 33,800 tons of rails. PWA loans have been approved for the purchase of 21,600 tons of rails by the Illinois Central. Boston & Maine is asking for a loan to buy 30,000 tons of rails and fastenings. St. Louis & San Francisco is petitioning for 26,000 tons of rails. Change in design of New York, New Haven & Hartford's angle bars is holding up an order for 10,000 tons of fastenings.

Structural shape awards dropped to 10,415 tons from 28,252 tons in the preceding week. Fabricators, however, express no apprehension, but expect to be busier in February than at any time in three years. Many projects are nearing maturity. Providence, R. I., has purchased 6000 tons of cast pipe; Boston is taking bids on 2500 tons. Chicago is starting to take bids on a sanitary project which will require 10,000 tons of reinforcing steel.

While the market for tin plate is quieter, canmakers are predicting larger requirements than last year. Export business in tin plate is improving. Argentine oil interests are inquiring for 10,000 to 15,000 base boxes. Japan also is buying. STEEL's London cablegram stresses rising confidence in world markets, with stronger prices in Europe.

Steel Code Tending To Restrict Contracting; Scrap Rise Highest of Seven Weeks Incline

In the United States there is an evolutionary movement in regard to contracting, comparatively few consumers now committing themselves for a full quarter, so long as they are given at least ten days' notice of impending price increases. A definite price policy for the second quarter has not yet emerged, some producers believing it would encourage buying; others, that it might dampen the buying now getting under way.

Raw materials are strong, except beehive furnace coke, which is down 25 cents a ton. STEEL's scrap composite is up 59 cents to $11.67, this rise being the largest of any in the seven consecutive weeks of the upward trend.

Steelworks operations last week rose 5 points to 59 per cent at Cleveland; 3 to 24 at Pittsburgh; 3 to 24½, eastern Pennsylvania; 3 to 32, Buffalo; 11 to 37, Youngstown. They declined 3 points to 29 at Chicago; 2 to 86, New England; and remained 79 at Detroit; and 52, Birmingham.

STEEL's iron and steel composite is unchanged at $32.43; and the finished steel composite, $51.10.

COMPOSITE MARKET AVERAGES

	Jan. 20	Jan. 13	One Month Ago Dec., 1933	Three Months Ago Oct., 1933	One Year Ago Jan., 1933	Ten Years Ago Jan., 1924
Iron and Steel Composite	$32.42	$32.42	$32.42	$31.59	$28.68	$43.26
Finished Steel Composite	51.10	51.10	51.10	49.20	46.13	67.71
Steelworks Scrap Composite	11.67	11.08	10.12	10.37	6.23	18.23

Iron and Steel Composite:—Pig iron, billets, slabs, sheet bars, wire rods, tin plate, nails, sheets, plates, shapes, bars, and black pipe. Finished Steel Composite:—Plates, shapes, bars, hot strip, nails, tin plate, pipe. Steelworks Scrap Composite:—Heavy melting steel and compressed sheets.

A COMPARISON OF PRICES

Representative Market Figures for Current Week; Average for Last Month, Three Months and One Year Ago

	Jan. 20, 1934	Dec. 1933	Oct. 1933	Jan. 1933
Finished Material				
Steel bars, Pittsburgh	1.75	1.75	1.75	1.60
Steel bars, Chicago	1.80	1.80	1.80	1.70
Steel bars, Philadelphia	2.04	2.04	2.04	1.91
Iron bars, Terre Haute, Ind.	1.60	1.60	1.60	1.65
Shapes, Pittsburgh	1.70	1.70	1.70	1.60
Shapes, Philadelphia	1.90	1.90½	1.90½	1.70
Shapes, Chicago	1.75	1.75	1.75	1.70
Tank plates, Pittsburgh	1.70	1.70	1.70	1.60
Tank plates, Philadelphia	1.88	1.88½	1.88½	1.66
Tank plates, Chicago	1.75	1.75	1.75	1.70
Sheets, No. 10, hot rolled, Pitts.	1.75	1.75	1.75	1.65
Sheets, No. 24, hot ann., Pitts.	2.25	2.25	2.25	2.05
Sheets, No. 24, galvan., Pitts.	2.85	2.85	2.85	2.70
Sheets, No. 10, hot rolled, Gary	1.85	1.85	1.85	1.80
Sheets, No. 24, hot anneal., Gary	2.35	2.35	2.35	2.25
Sheets, No. 24, galvan., Gary	2.95	2.95	2.95	2.85
Plain wire, Pittsburgh	2.20	2.20	2.10	2.15
Tin plate, per base box, Pitts.	5.25	5.25	4.65	4.25
Wire nails Pittsburgh	2.35	2.35	2.10	1.90
Semifinished Material				
Sheet bars, open-hearth, Youngs.	26.00	26.00	26.00	26.00
Sheet bars, open-hearth, Pitts.	26.00	26.00	26.00	26.00
Billets, open-hearth, Pittsburgh	26.00	26.00	26.00	26.00
Wire rods, Pittsburgh	36.00	36.00	35.00	36.20

	Jan. 20, 1934	Dec. 1933	Oct. 1933	Jan. 1933
Pig Iron				
Bessemer, del. Pittsburgh	19.26	19.26	19.26	15.76
Basic, valley	17.00	17.00	17.00	14.00
Basic, eastern, del. eastern Pa.	18.76	18.76	17.76	13.50
No. 2 foundry, del. Pittsburgh	18.76	18.76	18.76	15.76
No. 2 foundry, Chicago	17.50	17.50	17.50	15.50
Southern No. 2, Birmingham	13.50	13.50	13.50	11.00
No. 2X, Eastern, del. Phila.	19.63	19.63	18.63	13.76
Malleable, valley	17.50	17.50	17.50	14.50
Malleable, Chicago	17.50	17.50	17.50	15.50
Lake Superior charcoal, del. Chi.	23.54	23.54	23.54	23.04
Gray forge, del. Pittsburgh	18.38	18.38	18.38	15.63
Ferromanganese, del. Pittsburgh	90.24	87.24	87.24	73.24
Scrap				
Heavy melting steel, Pittsburgh	$13.50	12.20	12.45	8.35
Heavy melting steel, eastern Pa.	11.75	10.25	10.19	6.50
Heavy melting steel, Chicago	10.50	9.00	9.35	5.25
No. 1 wrought, eastern Pa.	12.75	11.00	10.75	6.50
No. 1 wrought, Chicago	10.35	8.45	9.10	5.00
Rails for rolling, Chicago	11.25	10.35	11.10	8.05
Coke				
Connellsville, furnace, ovens	3.50	3.75	3.25	1.75
Connellsville, foundry, ovens	4.25	4.25	3.85	2.50

Steel, Iron, Raw Material and Metals Prices

Prices conform to American Iron and Steel institute schedules. Asterisks denote price changes this week

Sheet Steel

HOT ROLLED No. 10
(24 to 48 inches wide)

Pittsburgh, base	1.75c
Gary, base	1.85c
Chicago, del.	1.88c
New York, del.	2.08c
Philadelphia, del.	2.04c
Birmingham, base	1.90c
St. Louis, del.	2.07c
F.o.b. cars, dock Pacific ports	2.42½c

HOT ROLLED ANN. No. 24

Pittsburgh, base	2.25c
Gary, base	2.35c
Chicago, del.	2.38c
Detroit, del.	2.45c
New York, del.	2.58c
Philadelphia, del.	2.54c
Birmingham, base	2.40c
St. Louis, del	2.57c
F.o.b. cars, dock, Pacific ports	2.95c

GALVANIZED No. 24

Pittsburgh, base	2.85c
Gary, base	2.95c
Chicago, del.	2.98c
Philadelphia, del.	3.14c
New York, del.	3.18c
Birmingham, base	3.00c
St. Louis, del	3.17c
San Francisco, f.o.b. cars, dock	3.55c

TIN MILL BLACK No. 28

Pittsburgh, base	2.65c
Gary, base	2.75c
St. Louis, del.	2.97c

COLD ROLLED No. 10

Pittsburgh, base	2.30c
Detroit, delivered	2.50c
Gary, base	2.40c
Philadelphia, del.	2.59c
New York, del.	2.63c

COLD ROLLED No. 20

Pittsburgh, base	2.75c
Detroit, base	2.95c
Gary, base	2.85c
Philadelphia, del.	3.04c
New York, del.	3.08c

ENAMELING SHEETS

Pittsburgh, No. 10	2.45c
Pittsburgh, No. 20	2.90c

Tin and Terne Plate

Per 100-lb. box, Pittsburgh. Gary base, 10 cents higher

Tin plate, coke base, contract	$5.25
Do., stock	4.55
Long ternes, No. 24 unassorted	3.25c

Corrosion and Heat Resistant Alloys

Base, Pittsburgh

18% chrome, 8% nickel; sheets, 35c; plates, 28c; bars, 24c; hot-rolled strip, 24.50c; cold-rolled strip, 32.00c.

	A	B	C	D
Bars	17c	18.5c	21c	26c
Plates	20c	21.5c	24c	29c
Sheets	25c	28c	31c	35c
Hot strip	17c	18.5c	21c	26c
Cold strip	22.5c	24c	27c	35c

Carbon 0.12 and under; no nickel. A has chrome 15% and under. B over 15/18% inc., C over 19/23% inc., D over 23/30%.

Steel Plates

Pittsburgh, base	1.70c
New York, del.	1.98c
Philadelphia, del	1.88½c
Boston, del.	2.10c
Buffalo, del	1.93½c
Chicago, base	1.75c
Cleveland, del.	1.88½c
Birmingham, base	1.85c
Coatesville, base	1.80c
Sparrow's Pt., base	1.80c
Pacific Coast, f.o.b. cars, dock	2.25c
St. Louis del	1.97c

Structural Shapes

Pittsburgh, base	1.70c
Philadelphia, del.	1.90½c
New York, del.	1.95½c
Boston, del.	2.08½c
Bethlehem, base	1.80c
Chicago, base	1.75c
Cleveland, del.	1.88½c
Buffalo, base	1.80c
Birmingham, base	1.85c
Pacific Coast, f.o.b. cars, dock	2.25c

Bars

SOFT STEEL

Pittsburgh, base	1.75c
Chicago, base	1.80c
Birmingham, base	1.90c
Buffalo, base	1.85c
Cleveland, base	1.80c
Detroit, del.	1.90c
Pacific Coast ports, cars, dock, c.i.f.	2.30c
Philadelphia, del.	2.04c
Boston, del.	2.19c
New York, del.	2.08c
Pitts., forg. qual.	1.75c-2.25c

RAIL STEEL
To Manufacturing Trade

Pittsburgh	1.65c
Chicago	1.70c
Cleveland	1.70c
Gary, Ind.	1.70c
Buffalo	1.75c

IRON

Terre Haute, Ind. base	1.60c
Philadelphia, base	1.74c
Pittsburgh, refined	2.75c-7.50c

REINFORCING
New billet, cut lengths, carlots

Pittsburgh	1.90c
Chicago, Gary, Buffalo, Cleve., Birm., Young	1.95c
Gulf ports	2.30c
Pacific coast ports	2.45c
Philadelphia, del.	2.19c
Rail steel	
Pittsburgh, base	1.75c
Chicago, Buffalo, Cleveland, Birm., Young.	1.80c
Gulf ports	2.15c
Pacific coast ports	2.30c

Wire Products □ □

(Prices apply to straight or mixed carloads; pool cars, or less, 10c up. 10% dis. on nail extras on straight or mixed carloads to one consignee.)

Base, Pittsburgh-Cleveland
(Per 100-lb. keg)

Standard wire nails	$2.35
Cement coated nails	2.35
Galvanized nails, 15 gage and coarser	4.35c
Do., 16 gage and finer	4.85c
(Per pound)	
Polished staples	3.05c
Galvanized fence staples	3.30c
Barbed wire, galv.	2.85c
Annealed fence wire	2.35c
Galvanized fence wire	2.70c
Woven wire fencing (base column, c.l.)	$60.00
Plain wire, 6-9 gage to mfg trade	2.20c

Anderson, Ind., Chicago up $1; Duluth up $2; Birmingham up $3.

Spring wire	3.20c

Chicago and Waukegan $1 higher, Worcester $2 higher.

Cold-Finished Carbon Bars

Base Pitts., one size, shape, grade, shipment at one time to one destination

10,000 to 19,999 lbs.	2.10c
20,000 to 59,999 lbs.	2.05c
60,000 to 99,999 lbs.	2.00c
100,000 lbs. and over	1.97½c

Chicago, Cleveland, up 5c; Buffalo, up 10c; Detroit, up 20c; eastern Michigan, up 25c.

Shafting □ □ □

Turned and ground, Pitts. base	
1⅛-inch	3.40c
1⅛ to 1½-inch	2.90c
1⅛ to 1⅞-inch	2.75c
1⅛ to 2⅞-inch	2.60c
*2⅛ to 7-inch	2.45c

Alloy Steel Bars □

Hot rolled
Pittsburgh, Buffalo, Chicago, Massillon, Canton 2.45c
Bethlehem 2.55c

Alloy S.A.E.	Diff.	Alloy S.A.E.	Diff.
2000	0.25	3100	0.55
2100	0.55	3200	1.35
2300	1.50	3300	3.80
2500	2.25	3400	3.20

4100 .15 to .25 Mo.	0.50
4600 .20 to .30 Mo. 125-1.75 Ni.	1.05
5100 .80-1.10 Cr.	0.45
5100 Cr. spring	base
6100 bars	1.20
6100 spring	0.70
Cr., Ni., Van.	1.50
Carbon van	0.95
9250 carbon base plus extras	

Strip and Hoops □

Hot strip to 23⅛-in. Pittsburgh	1.75c
Do., Chicago	1.85c
Do., del. Detroit	1.95c
Do., del. Phila.	2.04c
Do., del. N. Y.	2.08c
Cooperage hoop, Pittsburgh	1.85c
Do., Chicago	1.95c
Cold-rolled strip, Pitts., Cleve.	2.40c
Worcester	2.60c

Rails, Track Material □

(Gross Ton)

Standard rails, mill	$36.37½
Relay rails, Pitts. 20-45 lbs.	$26.00
50-60 lbs.	$23.00
70-75 lbs.	$18.00
80-85 lbs.	$24.00
100 lbs.	$25.00
Light rails, billet qual., Pitts., Chi.	$32.00
Do., reroll. qual.	$31.00
Angle bars, mills	2.55c
Spikes, R. R., base	2.40c
Track bolts, base	3.55c
Tie plates, base	1.90c

Base, light rails 25 to 40 lbs.; 50 to 60 lbs. inclusive up $5; 16 and 20 lbs., up $1; 12 lbs., up $2; 8 and 10 lbs., up $5. Base railroad spikes 200 kegs or more; base tie plates 20 tons or more; diff. for less.

Bolts and Nuts □ □

Pittsburgh, Cleveland, Birmingham, Chicago. Discounts to legitimate trade for all case lots. Dec. 1, 1932, lists.

CARRIAGE BOLTS

All sizes, cut thread	70 off
Rolled thread, ½ x 6 and smaller	70 off

MACHINE BOLTS

All sizes. cut thread, lag screws, plow bolts, Nos. 1-2-3-7 heads, tap bolts, blank bolts, stud bolts without nuts	70 off
Tire bolts	60 off
Stove bolts, 70-25-10 off in pkgs.; 83 off in bulk, 5000 or more of a size.	
Rolled thread machine bolts, ½ x 6 and smaller,	70 off
Step bolts	66 off
Elevator bolts	66 off

NUTS

Semifinished	70 off

HEXAGON CAP SCREWS

Milled	80-10-10 off
Upset 1-in., smaller	85 off

SQUARE HEAD SET SCREWS

Upset, 1-in., smaller	75-10 off
Upset, larger than 1-in.	75-10 off
Headless set screws	75 off

Rivets, Wrought Washers

Struc., c.l., Pittsburgh, Cleveland	2.75c
Struc., c.l., Chicago	2.85c
½-in. and smaller, Pitts., Chi., Cleve.	70 and 10 off
Wrought washers, Pitts., Chi., Phila.	6.00-6.25 off

Cut Nails, Piling □

Cut nails, Pitts.; (10% discount on size extras)	$2.75
Do. less carloads, 5 kegs or more; no discount on size extras	$3.00
Do., less than 5 kegs; no discount on size extras	$3.15
Steel piling, Pittsburgh	2.00c
Steel piling, Chi., Buff.	2.10c

Pipe and Tubing

Base $200 net ton, except on standard commercial seamless boiler tubes under 2 inches and cold drawn seamless tubing.

Welded Iron, Steel Pipe

Base discounts on steel pipe, Pitts., Lorain, O., to consumers in carloads. Gary, Ind., 2 points less. Chicago delivered 2½ points less. Wrought pipe, Pittsburgh base.

BUTT WELD

In.	Blk.	Gal.
Steel		
¼ and ⅜	57	38½
½	62	50½
¾	65½	55½
1—3	67½	58½
Iron		
½	31½	15
¾	36½	20½
1—1¼	39½	25½
2	41½	26

LAP WELD

Steel		
2	63½	54½
2½—3	66½	57½
3½—6	68½	59½
7 and 8	67½	57½
9 and 10	67	57
Iron		
2	37	22½
2½—3½	38	25
4—8	40	28½
9—12	38	24½

LINE PIPE

Steel	
⅛-inch, butt weld	50½
¼—⅜, butt weld	56
½, butt weld	61
¾, butt weld	64½
1—3, butt weld	66½
2-inch, lap weld	62½
2½—3, lap weld	65½
3½—6, lap weld	67½
7—8, lap weld	66½
Iron	
⅛—1½ inch, black and galv.	take 4 pts. over; 2½—6 inch 2 pts. over discounts for same sizes, standard pipe list. 8—12 inch no extra.

BOILER TUBES

C. L. Discounts, f.o.b. Pitts.

Lap Weld Steel		Charcoal Iron	
2—2¼	33	1¾	8
2½—2¾	40	2—2¼	13
3	47	2½—2¾	16
3¼—3¾	50	3	17
4	52	3¾—3½	18
4½—6	42	4	20
1½	1	4½	21

In lots of a carload or more, above discounts subject to preferential of two 5% discounts on steel and 10% on charcoal iron.

Lapwelded steel: Under 10,000 lbs., 6 pts. under base and one 5%; on 10,000 lbs. to carload, 4 pts, under base and two 5%. Quantity discounts same as for hot-rolled. Charcoal iron: Under 10,000 lbs., 2 pts. under base; on 10,000 lbs. to carload, base and one 5%.

SEAMLESS BOILER TUBES

Cold Drawn			
2—2¼	27	3¼—3½	41
2½—2¾	34	4	46
3	38	4½, 5, 6	43

(On 1—1¾-inch sizes mechanical tubing dis. apply.)

Hot Rolled			
2—2¼	33	3¼—3½	47
2½—2¾	40	4	49
3	44	4½, 5, 6	42

Quantity discounts: Under 10,000 lbs., 16 pts. and 5%; 10,000 to 24,999 lbs., 6 pts. and 5%; 25,000 lbs to carload, 2 pts. and 5 and 5%; carload and over, base discount and 5 and 5%. No extra for lengths 24 ft. and under.

Seamless Tubing □

Cold drawn; f.o.b. mill disc.

100 ft. or 150 lbs.	32%
15,000 ft. or 22,500 lbs.	70%

Cast Iron Water Pipe □

Class B Pipe—Per Net Ton

6-in. & over, Birm.	$36.00-37.00
4-in., Birm.	39.00-40.00
4-in., Chicago	47.00-48.00
6 to 24-in., Chicago	44.00-45.00
6-in. & over, east. fdy.	40.00
Do., 4-in.	43.00

Class A pipe $3 over Class B. Stnd. fitgs., Birm. base....$90.00

Six to 24-inch, fittings, base; over 24-inch plus $20; 4-inch, plus $10; 3-inch, plus $20; gas pipe fittings, 5 higher.

Semifinished Steel □

Prices Per Gross Ton

BILLETS AND BLOOMS
4 x 4 inch base

Pitts., Chi., Cleve., open-hth. & bess.	$26.00
Philadelphia	31.30
Forging, Pitts., Chi.	31.00

SHEET BARS

Pitts., Cleve., Yong.	26.00
Chicago	26.00
Canton, O.	26.00

SLABS

Pitts., Cleve., Yong.	26.00

WIRE RODS

Pitts., Cleveland	36.00
Chicago	37.00

SKELP

All grades, Pitts. and Chicago	1.60c

Coke □ □ □

Price Per Net Ton

BEEHIVE OVENS

*Connellsville fur.	$3.50
Connellsville fdry.	4.25
Connel. prem. fdry.	5.00- 5.25
New River fdry.	6.00
Wise county fdry.	4.25-5.00
Wise county fur.	3.50- 4.25

BY-PRODUCT FOUNDRY

Newark, N. J., del.	8.71- 9.31
Chi. ov., outside del.	8.50
Chicago, del.	9.25
New England, del.	10.50
St. Louis, del.	9.25
Birmingham, ovens	5.00
Indianapolis, del.	8.75
Ashland, Ky., Connellsville basis	6.00
Portsmouth, ovens, Connellsville basis	6.00
Buffalo, ovens	7.50- 8.00
Detroit, ovens	8.00
Philadelphia, del.	9.00

Coke By-Products □

Per gallon, producers' plants.

Tank lots	Spot
*Pure benzol	$0.205
*90 per cent benzol	$0.205
Toluol	0.30
Solvent naphtha	0.26
Commercial xylol	0.26

Per lb. f.o.b. New York

Pheno, (200 lb. drums)	0.163c
Do., (100 lb.)	0.173c

Per lb., producers' plants

Naphthalene flakes and balls	6.00- 7.25

Per 100 lb. Atlantic seaboard

Sulphate of ammonia	$1.25

Pig Iron

Delivered prices do not include switching charges except as noted. No 2 foundry iron is 1.75-2.25 silicon; 25-cent differentials apply for each 0.25 silicon above 2.25

Gross Tons

	No. 2 Fdry.	Malleable	Basic	Bessemer
Basing Points:				
Bethlehem, Pa.	$18.50	$19.00	$18.00	$19.50
Birdsboro, Pa.	18.50	19.00	18.00	19.50
Swedeland, Pa.	18.50	19.00	18.00	19.50
Sparrows Point, Md.	18.50	.....	18.00	.....
From Swedeland, Pa., del. to Phila.	19.26	19.76	18.76	.....
From Bethlehem, del. to Brooklyn	20.77	21.27	.....	.....
From Bethlehem, del. to Newark, N. J.	19.99	20.39	.....	.....
Basing Point:				
Everett, Mass.	18.50	19.00	18.00	19.50
From Everett, del. to Boston	19.00	19.50	18.50	20.00
Basing Point:				
Buffalo	17.50	18.00	16.50	18.50
From Buffalo, del. to Boston	19.00	19.50	18.50	20.00
Basing Points:				
Neville Island, Pa.	18.00	18.00	17.50	18.50
Sharpsville, Pa.	17.50	17.50	17.00	18.00
Youngstown, O.	17.50	17.50	17.00	18.00
From Neville Island, Pa., del. to Pittsburgh district	(Neville Island base, plus 63c to $1.13 switching charges)			
Basing Points:				
Erie, Pa.	17.50	18.00	17.00	18.50
Cleveland	17.50	17.50	17.00	18.00
Toledo, O.	17.50	17.50	17.00	18.00
Detroit	17.50	17.50	17.00	18.00
From Detroit, del. to Saginaw, Mich.	19.60	19.60	19.10	20.10
From Cleveland, del. to Akron, Canton, O.	18.76	18.76	18.26	19.26
From Toledo, del. to Mansfield, O.	19.26	19.26	18.76	19.76
Basing Point:				
Hamilton, O.	17.50	17.50	17.00	18.00
From Hamilton, del. to Cincinnati	18.51	18.51	18.01	19.01
Do., del. to Indianapolis	19.77	19.77	19.27	20.27
Basing Points:				
Duluth	18.00	18.00	.....	18.50
Chicago	17.50	17.50	17.00	18.00
Granite City, Ill.	17.50	18.00	17.00	.....
From Duluth, del. to St. Paul	19.94	19.94	.....	20.44
From Chicago, del. to Milwaukee	18.50	18.50	18.00	19.00
From Chicago, Toledo or Detroit, del. to Muskegon, Mich.	20.40	20.40	19.90	20.90
From Granite City, del. to St. Louis	18.00	18.50	17.50	.....
Basing Point:				
†Birmingham, Ala	13.50	.....	12.50	.....
From Birmingham, del. to:				
Boston	18.62	.....	18.12	.....
Newark, N. J.	19.58	.....	.....	.....
Brooklyn, N. Y.	20.39	.....	.....	.....
Baltimore	19.02	.....	18.52	.....
Philadelphia	18.88	.....	18.38	.....
Cleveland	19.64	.....	18.64	.....
Cincinnati	18.13	.....	17.13	.....
Chicago	18.16	.....	19.14	.....
St. Louis	17.62	.....	17.50	.....
Basing Point:				
Provo, Utah	16.50	.....	.....	.....

†Southern delivery only. Prices at northern points are adjusted to quotations on northern iron.

LOW PHOS.

Basing points: Birdsboro, Pa., Steelton, Pa., and Standish, N. Y.—$23.00. Basing point: Johnson City, Tenn.—$23.00

Philadelphia, standard and copper bearing 24.13

GRAY FORGE		CHARCOAL	
Valley furnace	17.25	Lake Superior fur.	20.50
Pitts. dist. fur.	17.75	Do., del. Chicago	23.54

SILVERY

Jackson County, O., base; 6%—$22.25; 7—$23.25; 8—$24.25; 9—$25.25; 10—$26.25; 11—$27.75.

BESSEMER FERROSILICON

Jackson County, O., base; 10%—$27.25; 11—$28.75; 12—$30.25; 13—$31.75; 14—$33.25; 15—$34.75; 16—$36.25.

Iron Ore

LAKE SUPERIOR ORE

Gross ton, 51½% Lower Lake Ports

Old range bess.	$4.30
Mesabi bessemer	4.65
Old range nonbess.	4.65
Mesabi nonbess.	4.50
High phosphorus	4.40

EASTERN LOCAL ORES

Cents, unit, del. E. Pa.

Foundry and basic, 56-63% con. (nom.)	8.00- 9.00
Cop.-free low phos. 58-65% (nom.)	10.00-10.50

FOREIGN ORE

Cents per unit, f.a.s. Atlantic ports Anom.Q

Foreign manganiferous ore, 45-55% iron, 6-10% man.	10.00
No. Afr. low phos.	9.50
Swedish basic, 65%	9.00
Swedish low phos	9.50
Snapish No. Africa basic, 50 to 60%	9.00
Tungsten, spot, sh. ton unit, duty pd.	$14.00-14.25
N. F. fdy., 55%	7.00
Chrome ore 48% gross ton, c.i.f.	$18.00

Manganese Ore

(Nominal)

Prices, not including duty, cents per unit, cargo lots.

Caucasian, 52-55%	22.00
So. African, 52%	21.00-22.00
So. Afr., 49-51%	20.00-21.00
Indian, 58-50%	nominal
Indian, 48-50%	nominal

Refractories

FIRE CLAY BRICK

Per 1000 f.o.b. Works

First Quality

Pa., Ohio, Ill., Ky., Md., Ga., Mo.	$45.00
Alabama	48.00

Second Quality

Pa., Ohio, Ill., Ky., Md., Mo., Ga., Ala.	40.00

MALLEABLE BUNG BRICK

All bases	50.00

SILICA BRICK

Pennsylvania	$45.00
Joliet, E. Chicago	54.00
Birmingham, Ala.	55.00

MAGNESITE BRICK

Dead burned grain, Chester, Pa., Baltimore bases, net	40.00
Domes, Chewelah, Wash., base	22.00

Fluorspar

85 and 5 per cent grade

Washed gravel, duey paid, tide, gross ton	$21.00
Washed gravel, f.o.b. Ill., Ky., net ton, carloads	$14.75-15.00

Ferroalloys

(In dollars, except Ferrochrome)

Ferromanganese, 78-82% tidewater, duty paid	85.00
del. Pittsburgh	90.24
Spiegeleisen, 19-20%, dom., fur., spot†	26.00
Ferrosilicon, 50%, freight all., cl.	77.50
Do., less carload	85.00
Do., 75 per cent. Spot, $5 a ton higher.	126-130.00
Silicomang., 2½ carb.	90.00
2% carbon	95.00
1% carbon	105.00
Ferrochrome, 66-70 chromium, 4-6 carbon, cts. lb. con. del.	10.00
Do., spot del.	10.00
Ferrotungsten, stand., lb. cont.	1.16- 1.25
Ferrovanadium, 35 to 40%, lb. cont., on analysis	2.70- 2.90
Ferrotitanium, c. l., prod. plant, frt. allow., net ton	137.50
Spot, 1 ton, frt., all., lb.	7.00
Do., under 1 ton	7.50
Ferrophosphorus, per ton, c. l., 17-19%, Rockdale, Tenn., basis; 18%, $2 unitage	50.00
Ferrophosphorus, electrolytic, per ton c. l., 23-26% f.o.b Anniston, Ala., 24% $2.75 unitage	65.00
Ferromolybdenum, stand, 50-60%, lb.	0.95
Molybdate, lb. cont.	0.80

†Carloads. Quan. diff. apply.

Nonferrous Mill Products

F.o.b. mill base, cents per lb. except as specified. Copper, brass products based on 8.25c Conn. copper

Sheets	
Yellow brass (high	13.75
Copper, hot rolled	15.00
Lead, cut, to jobbers	7.75
Zinc, 100-lb. base	9.00
Tubes and Pipes	
High yellow brass	16.25
Seamless copper	16.25
Rods	
High yellow brass	12.25
Copper, hot rolled	12.25
Anodes	
Copper, untrimmed	12.75
Wire	
Yellow brass (high)	14.25

Old Metals

Deal. buying prices, cents lb.

No. 1 Composition Red Brass	
*New York	4.37½-4.62½
*Chicago	4.50- 5.00
*Cleveland	5.00- 5.25
St. Louis	4.50- 4.75
Heavy Copper and Wire	
*New York	5.87½-6.12½
*Chicago, No. 1	5.87½-6.12½
*Cleveland	5.50- 5.75
St. Louis	5.50- 5.75
Composition Brass Borings	
*New York	4.12½-4.37½
Light Copper	
*New York	5.12½-5.37½
*Chicago	4.50- 4.75
*Cleveland	5.00- 5.25
St. Louis	4.50- 4.75
Light Brass	
*Chicago	2.87½-3.12½
*Cleveland	2.75- 3.00
Lead	
New York	3.00- 3.25
*Cleveland	2.75- 3.10
Chicago	2.75- 3.00
*St. Louis	3.10- 3.25
Zinc	
New York	2.25- 2.50
Cleveland	2.25- 2.50
Chicago	2.00- 2.25
*St. Louis	2.25- 2.50
Aluminum	
Clips, soft, Cleve.	13.00-14.00
Borings, Cleveland	5.50- 6.50
*Mixed, cast Cleve.	9.00- 9.25
Mixed, cast, St. L.	8.00- 8.50

Secondary Metals

*Brass ingot, 85-5-5-5	8.25
Remelt Al., No. 12	12.50

Iron and Steel Scrap Prices

Corrected to Friday night. Gross tons delivered to consumers, except where otherwise stated

HEAVY MELTING STEEL

Birmingham	9.50-10.50
Boston dealers	5.75- 6.25
Buffalo, No. 1	10.50-11.00
Buffalo, No. 2	9.00- 9.50
Chicago	10.50-10.75
Cleveland, No. 1	10.25-10.75
Cleveland, No. 2	9.75-10.25
Detroit, No. 1	9.00- 9.50
Detroit, No. 2	8.00- 8.50
Eastern Pa.	12.50-13.00
Eastern Pa., No. 2	9.50
Federal, Ill.	8.00- 8.50
Granite City, Ill.	9.00- 9.50
N. Y., deal. R. R.	8.75- 9.00
N. Y., deal. No. 2	7.50- 8.00
Pittsburgh, No. 1	13.25-13.75
St. Louis, No. 1 del.	10.00-10.50
Valleys, No. 1	13.00-13.50

COMPRESSED SHEETS

Buffalo, dealers	9.00- 9.50
Chicago, factory	9.25- 9.75
Cleveland	9.50-10.00
Detroit	8.50- 9.00
E. Pa., new mat.	10.50
Pittsburgh	13.00-13.50
Valleys	12.50-13.00

BUNDLED SHEETS

Buffalo	6.00- 6.50
Cincinnati, del.	5.75- 6.25
Cleveland	6.75- 7.25
Pittsburgh	11.00-11.50
St. Louis	5.00- 5.50

SHEET CLIPPINGS LOOSE

Chicago	5.50- 6.00
Cincinnati	5.00- 5.50
Detroit	6.00- 6.50
St. Louis	4.50- 5.00

STEEL RAILS, SHORT

Birmingham	11.50-12.50
Boston, dealers	5.25- 5.50
Buffalo	12.00-12.50
Chicago (3 ft.)	11.50-12.00
Chicago (2 ft.)	12.50-13.00
Cincinnati, del.	11.00-11.50
Detroit	10.50-11.00
Pitts., (open-hearth 3 ft. and less	15.00-15.50
St. Louis	12.00-12.50

STOVE PLATE

Birmingham	6.50- 7.50
Boston, dealers	4.50- 4.75
Buffalo	9.00- 9.50
Chicago, net	6.50- 7.00
Cincinnati, dealers	6.00- 6.50
Detroit, net	5.50- 6.00
Eastern Pa.	8.50- 9.00
N. Y., deal. fdry.	5.50- 6.00
St. Louis	6.50- 7.00

COUPLERS, SPRINGS

Buffalo	11.50-12.00
Chicago, springs	11.00-11.50
Eastern Pa.	14.00-15.00
Pittsburgh	15.00-15.50
St. Louis	11.00-11.50

ANGLE BARS—STEEL

Chicago	11.00-11.50
St. Louis	10.00-10.50

LOW PHOSPHORUS

Buffalo, billets and bloom crops	11.50-12.50
Cleveland, billet, bloom crops	12.50-13.50
Eastern Pa. crops	14.00-14.50
Pittsburgh, billet, bloom crops	16.00-16.50
Pittsburgh, sheet bar crops	16.00-16.50

FROGS, SWITCHES

Chicago	10.50-10.75
St. Louis	9.50-10.00

SHOVELING STEEL

Chicago	10.50-10.75
St. Louis	8.25- 8.75

RAILROAD WROUGHT

Birmingham	7.00- 8.00
Boston, dealers	5.00- 5.50
Buffalo, No. 1	8.00- 8.50
Buffalo, No. 2	10.50-11.00
Chicago, No. 1, net	9.00- 9.50
Chicago, No. 2	10.50-10.75
Cincinnati, No. 2	8.50- 9.00
Eastern Pa.	12.50-13.00
N. Y., No. 1 deal	8.00- 8.50
St. Louis, No. 1	6.00- 6.50
St. Louis, No. 2	8.50- 9.00

SPECIFICATION PIPE

Boston	4.50- 4.75
Eastern Pa.	10.00
New York, dealers	5.25- 5.50

BUSHELING

Buffalo, No. 1	9.00- 9.50
Chicago, No. 1	9.00- 9.50
Cinci., No. 1 deal	6.00- 6.50
Cincinnati, No. 2	2.50- 3.00
Cleveland, No. 2	8.00- 8.50
Detroit, No. 1 new	8.00- 8.50
St. Louis, No. 1	6.50- 7.00
Valleys, new No. 1	12.00-12.50

MACHINE TURNINGS

Birmingham	4.50- 5.00
Boston, dealers	2.75- 3.00
Buffalo	6.25- 6.75
Chicago	6.00- 6.50
Cincinnati, dealers	4.75- 5.25
Cleveland	7.75- 8.25
Detroit	6.00- 6.50
Eastern Pa.	7.00- 7.50
New York, dealers	3.25- 3.50
Pittsburgh	9.50-10.00
St. Louis	4.25- 4.75
Valleys	10.00-10.50

BORINGS AND TURNINGS

For Blast Furnace Use

Boston, dealers	1.75- 2.00
Buffalo	7.25- 7.50
Cincinnati, dealers	4.75- 5.25
Cleveland	8.00- 8.50
Detroit	7.00- 7.50
Eastern Pa.	6.00- 6.50
New York, dealers	2.00- 2.50
Pittsburgh	7.50- 8.00

CAST IRON BORINGS

Birming., plain	4.00- 4.50
Boston, chemical	8.50- 9.00
Boston, dealers	3.25- 3.50
Buffalo	7.25- 7.50
Chicago	6.50- 7.00
Cincinnati, dealers	4.75- 5.25
Cleveland	8.00- 8.50
Detroit	7.00- 7.50
E. Pa., chemical	12.00-15.00
New York, dealers	3.00- 3.50
Pittsburgh	7.50- 8.00
St. Louis	4.00- 4.50

PIPE AND FLUES

Cincinnati, dealers	4.00- 4.50

RAILROAD GRATE BARS

Buffalo	6.00- 6.50
Chicago, net	7.00- 7.50
Cincinnati	5.25- 5.75
Eastern Pa.	8.50- 9.00
New York, dealers	5.00- 5.50
St. Louis	5.50- 6.00

FORGE FLASHINGS

Boston, dealers	4.50- 5.00
Buffalo	8.50- 9.00
Cleve., over 10 in.	8.50- 9.00
Detroit	7.50- 8.00

FORGE SCRAP

Boston, dealers	4.50- 5.00
Chicago, heavy	11.00-11.50
Eastern Pa.	10.50-11.00

ARCH BARS, TRANSOMS

St. Louis	9.75-10.25

AXLE TURNINGS

Boston, dealers	3.50- 3.75
Buffalo	7.50- 8.00
Chicago, elec. fur.	9.00- 9.50
Cleveland	9.00- 9.50
Eastern Pa.	11.00
St. Louis	5.00- 5.50

STEEL CAR AXLES

Birmingham	11.00-11.50
Boston, ship. point.	8.00- 8.50
Buffalo	10.00-11.00
Chicago, net	10.50-11.00
Eastern Pa.	14.00
St. Louis	11.50-12.00

SHAFTING

Boston, ship. point.	10.25-10.50
Eastern Pa.	15.50
New York, dealers	11.00-11.50
St. Louis	9.00- 9.50

CAR WHEELS

Birmingham, iron	9.00-10.00
Boston, iron deal.	6.00- 6.50
Buffalo, iron	9.00- 9.50
Buffalo, steel	11.00-12.00
Chicago, iron	10.50-11.00
Chi., rolled steel	11.00-11.50
Cincinnati, iron	8.25- 8.75
Eastern Pa., iron	12.00-12.50
Eastern Pa., steel	14.00-15.00
Pittsburgh, iron	11.50-12.00
Pittsburgh, steel	14.75-15.25
St. Louis, iron	8.00- 8.50
St. Louis, steel	10.50-11.00

NO. 1 CAST SCRAP

Birmingham	9.00-10.00
Boston, No. 2	5.50- 5.75
Boston, tex. con.	10.25-10.50
Buffalo, cupola	10.00-10.50
Buffalo, mach.	10.50-11.50
Chicago, agri. net	8.00- 8.50
Chicago, mach. net	9.00- 9.50
Chi., railroad net	8.50- 9.00
Cinci., mach. cup	9.00- 9.50
Cleveland, cupola	10.50-11.00
Detroit, net	8.75- 9.25
Eastern Pa., cupola	11.50-12.50
Pittsburgh, cupola	12.50-13.00
San Francisco, del.	13.50-14.00
Seattle	4.50- 6.50
St. Louis, No. 1	8.00- 8.50
St. L., No. 1 mach.	8.50- 9.00

HEAVY CAST

Boston, del.	6.25- 6.50
Buffalo, break.	7.50- 8.00
Cleveland, break.	8.00- 8.50
Detroit, break	7.00- 7.50
Detroit, auto net	9.50-10.00
Eastern Pa.	11.00-11.50
N. Y., No. 1, deal	7.25- 7.75
N. Y., break deal	7.25- 7.75
Pittsburgh	11.50-12.00

MALLEABLE

Boston, consum.	12.00-12.25
Buffalo	11.00-11.50
Chicago, R. R.	10.75-11.25
Cinci., agri. del.	8.00- 8.50
Cinci., R. R. del.	8.50- 9.00
Cleveland, rail	11.00-11.50
Detroit, auto	8.50- 9.00
St. Louis, R. R.	8.50- 9.00
Eastern Pa., R. R.	11.50-12.50

RAILS FOR ROLLING

5 feet and over

Birmingham	11.00-11.50
Boston, dealers	7.00- 7.25
Buffalo	9.00- 9.50
Chicago	11.00-11.50
Eastern Pa.	12.50
New York, dealer	7.00- 7.50
St. Louis	10.75-11.25

LOCOMOTIVE TIRES

Chicago (cut)	11.00-11.50
St. Louis, No. 1	8.75- 9.25

LOW PHOS. PUNCHINGS

Buffalo	11.00-11.50
Chicago	12.50-13.00
Eastern Pa.	14.00-15.00
Pittsburgh	14.50-15.00

Nonferrous Metal Prices of the Week

Spot unless otherwise specified. Cents per pound

	Copper: Electro., del. Conn.	Copper: Lake, del. Midwest	Copper: Casting, refinery	Straits Tin, New York: Spot	Straits Tin, New York: Futures	Lead, N. Y.	Lead, East St. L.	Zinc, St. L.	Aluminum 98-99%	Antimony Spot, N. Y.	Ingot Nickel
Jan. 13	8.00	8.12½	7.75	52.10	52.70	4.00	3.90	4.25	*22.90	7.25	35.00
Jan. 15	8.00	8.12½	7.75	53.00	53.40	4.00	3.90	4.25	*22.90	7.25	35.00
Jan. 16	8.00	8.12½	7.75	52.45	52.85	4.00	3.90	4.25	*22.90	7.25	35.00
Jan. 17	8.00	8.12½	7.75	51.75	52.15	4.00	3.90	4.25	*22.90	7.20	35.00
Jan. 18	8.25	8.37½	8.00	51.25	51.65	4.00	3.90	4.30	*22.90	7.20	35.00
Jan. 19	8.37½	8.50	8.12½	51.90	52.10	4.00	3.90	4.30	*22.90	7.20	35.00

*Nominal quotation. Market range 19.90c to 22.90c.

Warehouse Iron and Steel Prices

Cents per pound for delivery within metropolitan districts of cities specified

STEEL BARS	□
Baltimore* ..	2.75c
Boston††	2.90c
Buffalo	2.95c
Chattanooga..	3.26c
Chicago	2.90c
Cincinnati	3.10c
Cleveland	2.90c
Detroit	2.98½c
Houston	3.00c
Los Angeles..	3.40c
New Orleans	3.00c
New York‡(d)	3.17c
Pittsburgh	2.85c
Philadelphia*	2.75c
San Francisco	3.55c
Seattle	3.40c
St. Louis	3.14c
St. Paul	3.00c
Tulsa	3.25c

IRON BARS	□
Portland	3.40c
San. Fran.	3.55c
Baltimore*	2.75c
Baltimore* ...	2.60c
Chattanooga..	3.26c
Chicago	2.75c
Cincinnati	3.10c
Detroit	2.98½c
New York‡(d)	3.10c
Philadelphia*	2.75c
St. Louis	3.14c
Tulsa	3.25c

REINFORC. BARS	□
Boston 2.75c-3.25c	
Buffalo	1.95c
Chattanooga..	3.26c
Chicago 1.95c-2.10c	
Cleveland (c)	1.97½c
Cincinnati	3.10c
Houston	3.00c
Los Ang., cl...	3.10c
New Orleans	3.00c
New York	3.17c
Philadelphia..	2.62½c
Pitts., plain...	3.00c
Pitts., twisted squares	3.12½c
Seattle	3.50c
St. Louis	3.29c
Tulsa	3.25c
Young. 2.30c-2.60c	

SHAPES	□
Baltimore* ...	2.60c
Boston††	3.07c
Buffalo	3.20c
Chattanooga..	3.46c
Chicago	3.10c
Cincinnati	3.30c
Cleveland	3.21c
Detroit	3.30c
Houston	3.00c
Los Angeles..	3.40c
New Orleans	3.50c
New York(d)	3.27c
Philadelphia*	2.75c
Pittsburgh	3.05c
Portland	3.40c
San Francisco	3.50c
Seattle	3.40c
St. Louis	3.34c
St. Paul	3.25c
Tulsa	3.50c

PLATES	□
Baltimore*	2.75c
Boston††	3.08c
Buffalo	3.20c
Chattanooga..	3.46c
Chicago	3.10c
Cincinnati	3.30c
Cleveland, ¼ in. and thicker.	3.21c
Cleve., ⅜-in.	3.20c
Detroit	3.30c
Det., ⅜-in.....	3.10c
Houston	3.00c
Los Angeles..	3.40c
New Orleans	3.50c
New York(d)	3.30c
Philadelphia*	2.75c
Phila. floor....	4.35c
Pittsburgh	3.05c
Portland	3.40c
San Fran.	3.50c
Seattle	3.40c
St. Louis	3.34c
St. Paul	3.25c
Tulsa	3.50c

NO. 10 BLUE	□
Baltimore* ..	2.95c
Boston††	2.90c
Buffalo	3.10c
Chattanooga..	3.26c
Chicago	2.95c
Cincinnati	3.10c
Cleveland	3.01c
Det., 8-10 ga.	3.03½c
Houston	3.35c
Los Angeles..	3.65c
New Orleans	3.50c
New York	3.17c
Portland	3.65c
Philadelphia*	2.95c
Pittsburgh	2.85c
San Fran.	3.75c
Seattle	3.65c
St. Louis 3.19c-3.36c	
St. Paul	3.45c
Tulsa	3 70c

NO. 24 BLACK	□
Baltimore*†..	3.50c
Boston (g) ..	3.75c
Buffalo	3.25c
Chattanooga..	4.01c
Chicago	3.70c
Cincinnati	3.85c
Cleveland	3.76c
Detroit	3.78½c
Los Angeles..	4.15c
New York	3.65c
Philadelphia*†	3.40c
Pittsburgh**..	3.40c
Portland	4.25c
San Fran.	4.25c
Seattle	4.25c
St. Louis	3.94c
St. Paul	3.695c
Tulsa	4.75c

NO. 24 GAL. SHEETS	□
Baltimore*†..	3.75c
Buffalo	4.00c
Boston (g) ..	4.35c
Chattanooga..	4.61c
Chicago 4.20c-4.30c	
Cincinnati	4.45c
Cleveland	4.36c
Detroit	4.45c
Houston	3.90c
Los Angeles..	4.75c
New Orleans	4.35c
New York	4.25c
Pitts.** 3.90c-4.20c	
Portland	4.85c
San Fran.	4.85c
Seattle	4.85c
St. Louis	4.54c
St. Paul	4.19c
Tulsa	5.10c
Phila.*†	4.00c

BANDS	□
Baltimore	3.05c
Boston††	3.15c
Buffalo	3.30c
Chattanooga..	3.51c
Chicago	3.20c
Cincinnati	3.35c
Cleveland	3.26c
Detroit, ⅛-in. and lighter	3.28½c
Houston	3.25c
Los Angeles..	3.80c
New Orleans	3.20c
New York(d)	3.42c
Philadelphia..	3.05c
Pittsburgh	3.10c
Portland	3.90c
San Fran.	3.15c
Seattle	3.90c
St. Paul	3.20c
Tulsa	3.45c
St. Louis	3.44c

HOOPS	□
Baltimore	2.80c
Boston	4.15c
Buffalo	3.55c
Chicago	3.20c
Cincinnati	3.35c
Det., No. 14 and lighter	3.28½c
New York	3.42c
Philadelphia..	3.30c
Pittsburgh	3.75c
Seattle	5.40c
St. Paul	3.75c

COLD FIN. STEEL	□
Baltimore (c)	3.56c
Boston 4.00c-4.50c	
Buffalo	3.25c
Chattanooga*	4.06c
Chicago	3.50c
Cincinnati	3.70c
Cleveland	3.40c
Detroit	3.40c
Los Ang.(f)..	5.95c
New Orleans	4.25c
New York...3.92c-4.42c	
Philadelphia..	3.73c
Pittsburgh	3.45c
Portland (f)..	4.75c
San Fran. (f)	5.95c
Seattle (f)....	4.75c
St. Paul	3.20c
St. Louis.....	3.74c
Tulsa	4.65c

COLD ROLL. STRIP	□
Boston, 0.100-in., 500 lb. lots	5.20c
Buffalo	5.25c
Chicago (b)..	5.65c
Cincinnati	5.80c
Cleveland (b)	5.55c
Detroit	5.40c
Philadelphia..	4.00c
New York.....	4.55c
St. Louis	5.74c

(b) Net base, straightening, cutting, boxing, 1 ton or more.

(c) Plus mill, size and quantity extras.

(d) Minus quant. diff.

(e) New mill classif.

(f) Rounds only.

(g) 50 bundles or over.

‡Domestic bars.

*Plus. quan. extras.

**Under 25 bundles.

*†50 or more bundles.

†New extras apply.

††Base 40,000 lbs., extras on less.

Prices at Detroit, Cleveland, Chicago, Pittsburgh, Cincinnati, Chattanooga, NewYork, Boston, St. Louis on heavier lines are subject to new quantity differentials:

399 pounds and less, up 50 cents; 400 to 9999 pounds, base; 10,000 to 19,999 pounds, 15 cents under; 20,000 to 39,999 pounds, 25 cents under; 40,000 pounds and over, 35 cents under base.

Current Iron and Steel Prices of Europe

Dollars at Rates of Exchange, Jan. 18

Export Prices f. o. b. Ship at Port of Dispatch—By Cable (or Radio)

PIG IRON	British gross tons U. K. ports £ s d		Continental Channel or North Sea ports, metric tons Gold parity, $4.8665 £ s d	
Foundry, 2.50-3.00 Silicon.	$14.54	2 18 6	$8.88	1 16 6
Basic bessemer.....	13.42	2 14 0*	7.30	1 10 0
Hematite, Phos. .03-.05....	14.91	3 0 0	....	.....
SEMIFINISHED STEEL				
Billets.....	$27.34	5 10 0	$11.44	2 7 0
Wire rods, No. 5 gage.....	38.77	7 16 0	21.90	4 10 0
FINISHED STEEL				
Standard rails.....	$38.52	7 15 0	$26.77	5 10 0
Merchant bars.....	1.55c	7 0 0	.69c	3 2 6
Structural shapes.....	1.64c	7 7 6	.63c	2 17 6
Plates, †¼ in. or 5 mm.....	1.78c	8 0 0	.89c	4 1 0
Sheets, black, 24 gage or 0.5 mm.....	2.05c	9 5 0	1.27c	5 15 0
Sheets, gal., 24 gage, corr...	2.50c	11 5 0	1.65c	7 10 0
Bands and strips.....	1.78c	8 0 0	.85c	3 17 6
Plain wire, base.....	2.05c	9 5 0	1.18c	5 7 6
Galvanized wire, base.....	2.44c	11 0 0	1.38c to 1.40c	6 5 6 to 6 7 6
Wire nails, base.....	2.66c	12 0 0	1.27c	5 15 0
Tin plate, box 108 lbs.....	$ 4.10	0 16 6	....	.....

British ferromanganese $82 to $85 delivered Atlantic seaboard, duty-paid. German ferromanganese £9 0s 0d 4(43.74) f.o.b.

Domestic Prices at Works or Furnace—Last Reported

	£ s d		French Francs		Belgian Francs		Reich Marks	
Fdy. pig iron, Si. 2.5.....	$15.53	3 2 6(a)	$12.83	205	$13.57	305	$23.88	63
Basic bessemer pig iron....	16.15	3 5 0(a)*	11.58	185	12.91	290	26.34	69.50
Furnace coke.....	3.98	0 16 0	7.51	120	4.90	110	7.30	19.25
Billets.....	27.33	5 10 0	25.35	405	19.58	440	36.57	96.50
Standard rails.....	1.83c	8 5 0	1.96c	700	2.20c	1,100(b)	2.27c	132
Merchant bars.....	1.69c	7 12 6	1.57c	560	1.07c	535	1.89c	110
Structural shapes.....	1.94c	8 15 0	1.54c	550	1.07c	535	1.85c	107.50
Plates,†¼-in. or 5 mm.....	1.89c	8 10 0	1.90c	680	1.35c	675	2.18c	127
Sheets, black.....	2.28c	10 5 0§	2.38c	850‡	1.50c	750‡	2.48c	144‡
Sheets, galv., corr., 24 ga. or 0.5 mm.....	2.83c	12 15 0	4.06c	1,450	3.00c	1,500	6.36c	370
Plain wire.....	2.05c	9 5 0	3.16c	1,130	2.20c	1,100	3.04c	177
Bands and strips.....	2.33c	10 10 0	1.82c	650	1.40c	700	2.18c	127

*Basic. †British ship-plates. Continental, bridge plates. §24 ga. ‡1 to 3 mm. basic price. British quotations are for basic open-hearth steel. Continental usually for basic-bessemer steel. a del. Middlesbrough. b Since January.

Bars

Bar Prices, Page 38

Soft steel bar sales and specifications are increasing slightly. Improvement so far this month has been only moderate with delays in the placing of automotive business a factor in retarding total demand. The tendency in buying and in consumption is upward.

Requirements of farm implement manufacturers at Chicago, while still slow, are substantially heavier than a year ago. Fairly active shipments of reinforcing bars are helping to sustain bar mill operations. The market continues 1.80c, Chicago, for soft steel bars, 1.70c for rail steel and 1.60c, Terre Haute, Ind., for bar iron.

The merchant steel bar market has been inactive in January with more tonnage in prospect than being closed. Few buyers are under contract as the spot and contract markets are now alike at 1.75c base, Pittsburgh. Alloy bars are 2.45c, Pittsburgh, with specifications increasing.

Contracting for steel bars in the New York area has perhaps proceeded at a better rate than for other major products, although releases are slow. The market is 2.08c, New York.

Commercial steel bars are being bought on a hand-to-mouth basis at Philadelphia, with most manufacturing consumers well covered by heavy releases last month.

Drop forging shops in and near Cleveland are more active, mainly for automotive work. Manufacturers of small farm implements in northern Ohio are experiencing the best demand since 1930. Requirements for road building machinery also are increasing. Sales by one manufacturer in the first 12 days of January were larger than for any three months of the past three years.

Commercial steel bar specifications in New England are exceeding expectations.

Plates

Plate Prices, Page 38

Plate buying is affected adversely by light requirements of fabricators of tanks and other products and by delayed demand from railroads.

Operations of tank fabricators at Chicago are the lightest in about six months and orders and inquiries for fabricated material are slow to increase. While the oil industry has tentative programs for plant improvement, few inquiries for such work are appearing.

Led by more active inquiry from private sources for river barges, the plate market at Pittsburgh seems to be headed for improvement. Although inquiries are only occasionally for more than a single barge, this activity is expected to take form early in February. There is no change in the base price of plates, the market continuing 1.70c base, Pittsburgh, although an advance still is rumored.

Carload orders are the rule at Cleveland. Recently there have been calls for some extra heavy plates for equipment manufacturers. Slow operations at mills make it more difficult to get through some orders for plates of special analysis.

Railroad requirements continue to absorb major interest in the plate market in eastern Pennsylvania. Specifications for the Pennsylvania's carbuilding program are expected out almost momentarily. The Reading Co. is buying 600 tons of plates, among other materials, for continuation of its car repair program at Reading, Pa. This tonnage is regarded as a forerunner of heavy purchases, which will include requirements for car repair work for the Jersey Central, as well. Plates are unchanged at 1.80c, Coatesville, or 1.88½c, Philadelphia.

Contracts Placed

115 tons, 300,000-gallon water tank, Mitchell, S. Dak., to Pittsburgh-Des Moines Steel Co., Des Moines, Iowa. Cast Iron pipe, several hundred tons to J. B. Clow & Sons Co., Chicago.

100 tons, repairs to steamer TACOMA, to Todd Dry Docks Inc., Seattle.

Unstated tonnage, steel tank and tower, Fort Meade, Maryland, to Pittsburgh-Des Moines Steel Co., Pittsburgh, $14,135; bids Dec. 12.

Contracts Pending

1700 tons, armor plate, ordnance department, navy, Washington; bids Feb. 3.

1050 tons, drum gates, Friant dam near Fresno, Calif., for Central Valley water project; bids soon.

709 tons, pipe line, Kennett dam near Redding, Calif., for Central Valley water project; bids soon.

640 tons, pipe line, Contra Costa conduit Central Valley water project, Calif.; bids soon.

250 tons, water storage tanks, St. Johnsbury, Vt.; Barker & Wheeler, low; no award yet made on cast pipe.

170 tons, pipeline, Friant dam, Fresno county, California, for Central Valley water project; bids soon.

110 tons, 240-inch welded pipe, Inglewood, Calif.; bids rejected.

100 tons, gasoline storage system, Hamilton Field, Calif.; bids opened.

100 tons or more, self-propelled channel and snag boat for Vicksburg, Miss., army engineers; bids of Jan. 22 postponed until Jan. 31.

Unstated tonnage, 150,000-gallon elevated water tank, Southern Pines, N. C.; federal loan approved.

Unstated tonnage, 100,000-gallon water tanks, and several hundred tons 6, 8 and 10-inch cast iron pipe, Carolina Beach, N. C.

Sheets

Sheet Prices, Page 38

Pittsburgh reports sheet orders are in heavier volume, due mainly to ordering by automobile manufacturers. All prices are firm with the following Pittsburgh bases quoted: Cold-rolled, 2.30c and 2.75c for No. 10 and No. 20 gage, respectively; black sheets, 2.35c; galvanized, 2.85c; and light plates 1.75c.

Automotive orders at Cleveland are more plentiful, the Cleveland sheet mills working near capacity last week, and the mills in an adjacent lake district at 80 to 85 per cent. Ford, General Motors and Chrysler continue to release material. Light demand from other leading sources is reported.

Consumers generally are not committing themselves to contracts for the first quarter, something not entirely unexpected by sellers in view of the fact warning is given ten days or more ahead of the time when prices are to be advanced.

Sheet demand in the Chicago district is sustained in a large measure by active requirements of the automotive industry. Orders for full finished material have shown a relatively greater improvement so far this month than have purchases of most other grades.

Philadelphia sellers are interested in a report that the Pennsylvania railroad is considering the possibility of buying No. 13 gage sheets, 72 inches wide and 35 feet long for use in the construction of box cars. The Pennsylvania's requirements are expected to become definitely known shortly. Philco Radio is said to have a new production schedule which will require considerable flat rolled products.

Sheet sellers in New York do not expect substantial revival in buying before spring building sets in, unless there is an early advance in price which might result in considerable protective covering.

Demand at Cincinnati is steadily expanding, with district mills operating near 40 per cent. Miscellaneous demands at St. Louis show further slight gain.

Some improvement is noted in New England, railroads taking or considering heavier shipments and miscellaneous specifications slightly more numerous.

Shapes

Structural Shape Prices, Page 38

Featuring a lighter volume of shapes awarded during the week are 3200 tons for river locks at Alton, Ill., and Dubuque, Iowa. Bids are yet to be taken on two other similar units.

The interstate commerce commission having approved the Pennsylvania railroad loan of $77,000,000, structural interests at Philadelphia are watching developments closely in connection with the release of tonnage for work remaining on the railroad's electrification program.

As noted previously, approximately 40,000 tons are estimated as still pending for release against old contracts, and possibly 8000 to 9000 tons of new work considered for yard poles at various points. A portion of the long pending tonnage may be canceled.

The volume of structural contracts at Pittsburgh in the past week declined to the lowest point of any week this year. Although plain material prices are firm at 1.70c base, Pittsburgh, fabricated and erected prices are irregular.

Bids were taken by United States engineers at Cleveland on 1750 tons of sheet piling for a breakwater at Huron, O., but award has been postponed, pending action at Washington.

Medium size lots make up a fair total of awards in the Buffalo district. Three New York state prison jobs will take 1100 tons.

More public works projects are coming to the front in New England, and the outlook for the next few months is encouraging.

Awards in the New York territory are light. Pending requirements total about 25,000 tons of which bids are in on 20,000 tons.

Washington reports that the federal public works administrator has shut off distribution of PWA funds to the Triboro bridge authority, New York, until proper accounting for the use of funds is approved, and PWA is satisfied the recovery purposes for which the allotment was made will be accomplished. About 12,000 tons of shapes have been pending for the towers.

Contracts Placed

2200 tons, lock No. 26, Alton, Ill., to American Bridge Co., Pittsburgh.

1500 tons, supestructure bridge, Kanawha river, St. Albans, W. Va., to McClintic-Marshall Corp., Bethlehem, Pa. Reported last week as 1300 tons.

1500 tons, roller crest dam, Montgomery island, Ohio river, below Pittsburgh, to Independent Bridge Co., Neville Island, Pittsburgh.

1000 tons, lock No. 11, Dubuque, Iowa, to Lakeside Bridge & Steel Co., Milwaukee.

645 tons, highway bridges, Jefferson, Green and Oregon counties, Missouri, to Midland Structural Steel Co., Cicero, Ill.

370 tons, turbine supports, Richmond street powerhouse, Philadelphia to McClintic-Marshall Corp., Bethlehem, Pa.; through United Engineers & Constructors Inc., Philadelphia.

325 tons, piling, Panama canal, for United States navy to Inland Steel Co., Chicago.

300 tons, state bridge, Liberty village, Sullivan county, N. Y., to McClintic-Marshall Corp., Bethlehem, Pa.; Parker & Graham Inc., Clifton, N. J., general contractor.

280 tons, bridge, Scott county, Missouri, to Illinois Steel Bridge Co., Jacksonville, Ill.

275 tons, bridge, Buena Vista, Va., to Virginia Bridge & Iron Co., Roanoke, Va.

270 tons, school, Clinton, Iowa, to Clinton Bridge Co., Clinton.

250 tons, shapes and bars, dormitory at University of Minnesota, Minneapolis; shapes to American Bridge Co., Pittsburgh; bars to Cowin & Co., Minneapolis; through Bracker Construction Co.

235 tons, state bridges, Alcorn and Bolivar counties, Mississippi, to Virginia Bridge & Iron Co., Roanoke, Va.

215 tons, highway bridge, Shandaken, Ulster county, New York, to National Bridge Co., Long Island City, N. Y.

200 tons, building, Krebs Pigment & Color Corp., Curtis Bay, Md., to Bethlehem Fabricators Inc., Bethlehem, Pa.

180 tons, state bridge, carrying route 29 across south branch of Raritan river, section 11A, Hunterdon county, New Jersey, McClintic-Marshall Corp., Bethlehem, Pa.; Parker & Graham, Clifton, N. J., general contractor. Kalman Steel Corp., Bethlehem, Pa., awarded 32 tons of reinforcing bars.

170 tons, grandstand, Marietta, O., to Pittsburgh-Des Moines Steel Co., Pittsburgh.

170 tons, three state highway bridges, New Jersey to McClintic-Marshall Corp., Bethlehem, Pa.

170 tons, cofferdam braces, highway bridge, Cape Cod canal, Sagamore, Mass., to American Bridge Co., Pittsburgh.

165 tons, building, Perfect Circle Co., Hagerstown, Ind., to Insley Mfg. Co., Indianapolis.

160 tons, platform canopies, Erie railroad station, Elmira, N. Y., to McMannus Steel Construction Co. Inc., Buffalo.

150 tons, addition to Golden West Brewery, Oakland, Calif., to Western Iron Works, San Francisco.

150 tons, school, Richmond, Calif., to Schraders Iron Works, San Francisco.

150 tons, state highway bridge, Charme, Wis., to American Bridge Co., Pittsburgh.

135 tons, shapes and bars, postoffice, Lewiston, Me., shapes to Lehigh Structural Steel Co., Allentown, Pa., and bars to Truscon Steel Co., Youngstown, O.; through Coath & Goss, Chicago.

135 tons, armory, Ticonderoga, N. Y., to Belmont Iron Works, Philadelphia; through Leon Wexler.

135 tons, bridge, Montpelier-Northfield road, Vermont, to American Bridge Co., Pittsburgh; B. A. Barton, general contractor.

126 tons, bridge, Sheridan county, Wyoming, to Omaha Steel Works, Omaha, Nebr.; previously reported as going to unstated fabricator.

116 tons, bridge, carrying route 6, section 1-F across route No. 2 north, Hasbrouck Heights, Bergen county, New Jersey, to American Bridge Co., Pittsburgh; Tidewater Stone & Supply Co., Hackensack, N. J., general contractor. Concrete Steel Co., New York, awarded 76 tons of reinforcing steel.

100 tons, shapes and bars, boys' dormitory, state school, Rosewood, Md., to Maryland Steel Products Co., Baltimore; Davis Construction Co., Baltimore, general contractor.

100 tons, addition, Chevrolet Motor Co. building, St. Louis, to Atlas Iron Works, St. Louis.

100 tons, addition to Chevrolet Motor Co. plant at Buffalo, to R. S. McMannus Steel Construction Co., Buffalo.

Unstated tonnage, shapes and bars, Owings Mills Distillery, Owings Mills, Md., to Deitrich Bros., Baltimore; B. H. Maas, Baltimore, general contractor.

Shape Awards Compared

	Tons
Week ended Jan. 20	**10,720**
Week ended Jan. 13	**28,252**
Week ended Jan. 6	**14,961**
This week in 1933	**11,332**
Weekly average for 1933	**15,413**
Weekly average 1934	**17,977**
Weekly average, Dec.	**22,058**
Total to date 1933	**25,580**
Total to date 1934	**53,933**

Contracts Pending

6000 tons, St. Louis municipal auditorium; new bids called for Feb. 7.

3200 tons, sheet piling, bulkhead at Government island, Oakland, Calif.; M. B. McGowan, San Francisco, low for general contract.

1855 tons, highway underpass and railroad bridge over Missouri river on proposed government railroad connecting Fort Peck, Montana, dam site with Great Northern railroad; bids Jan. 25 to United States engineer, Kansas City, Mo. Work also includes 48,440 lineal feet sheet piling and 150 tons of hardware and other miscellaneous material.

1500 to 2500 tons, causeway, Mare Island, Calif. Clinton Construction Co., San Francisco, awarded general contract.

1500 tons, Philadelphia approach to speedline over Delaware river bridge, that city; Builders Inc., Philadelphia, low on general contract; approximately 3000 tons of shapes and 2500 tons of steel piling will be required for Camden approach, with bids likely to be opened in March.

1500 tons, Park street bridge, Alameda county, California.

1419 tons, Friant dam canal, Fresno county, California, for Central Valley water project; bids soon.

1200 tons, lock No. 18, Mississippi

river near Burlington, Iowa; Maxon Construction Co., Dayton, O., general contractor.
1200 tons, 20 highway bridges, Missouri.
1100 tons, postoffice ramps, Pittsburgh; revised bids of Jan. 19 to treasury department, Washington, postponed to Jan. 26.
1050 tons, permanent piling, roller crest dam, Montgomery island, Ohio river near Pittsburgh; Booth & Flinn Co., Pittsburgh, general contractors; piling purchase to be made late in February.
1040 tons, Calvert street bridge, Washington; bids postponed to Feb. 5.
900 tons, Erie county, New York highway bridges; bids in.
800 tons, gymnasium addition, military academy, West Point, N. Y.; bids in.
625 tons, drum gates for Kennett dam, near Redding, Calif., for Central Valley water project; bids soon.
625 tons, three highway bridges, Oklahoma.
400 tons, static test building for war department, at Dayton, O.; bids Jan. 25, to quartermaster, Dayton.
400 tons, three highway bridges, Iowa.
400 tons, plant building, Cincinnati, for Andrew Jergens Co.
400 tons, addition, Auburn, N. Y., prison; bids Jan. 26.
364 tons, trash racks for Kennett dam, near Redding, Calif., for Central Valley water project; bids soon.
360 tons, highway bridges, Georgia.
350 tons, addition, Elmira, N. Y., reformatory; bids in.
350 tons, addition, Comstock, N. Y., prison; bids in.
325 tons, four highway bridges, Texas.
225 tons, highway bridges, Maryland.
278 tons, Eel river bridge, Humboldt county, California, for state; general contract to Neves & Sharp, Santa Clara, Calif.
130 tons, state highway bridge, Tula, Mich.
100 tons, power plant for Shelby, O.; bids Jan. 22.

Reinforcing

Reinforcing Bar Prices, Page 39

Reinforcing bar business at Chicago is fairly active, both as regards shipments and new awards. Orders include 435 tons for an Illinois bridge and 350 tons for state road work. For an industrial plant in Louisiana 800 tons have been placed.

About 2000 tons of bars are pending for several Mississippi river locks on which bids have been taken, with 1000 tons additional required for two units on which bids will be taken soon.

Chicago sanitary district is starting to take bids on additional sewage plant work. The entire project will take about 10,000 tons of bars, the first unit being figured requiring 700 tons. Prices there generally are steady at 1.95c for cut lengths of billet bars, and 1.80c for rail steel.

Bids on 500 tons of new billet steel bars for the Pittsburgh postoffice ramps have been postponed until Jan. 26, but other inquiries are more numerous and include a 500-ton Norfolk, Va., bridge and a similar tonnage which a Dayton, O., general contractor will buy for a Mississippi lock. Mill lengths of new billet steel bars are 1.80c, Pittsburgh.

Philadelphia reports reinforcing bar business spotty, with three orders totaling 325 tons, and with 400 tons pending for the Philadelphia approach to the Delaware river bridge speedline. Billet steel bars in cut lengths continue at 1.90c, Pittsburgh, or 2.19c, Philadelphia.

Small-lot buying in New England is heavier with a fair tonnage pending for larger projects.

While fabricators at Cleveland are doing comparatively little figuring at present, this is not causing them any apprehension, as public works projects now in the formative stage, they say, will mean a rush of work in February. The first portion, 230 tons of bars, for a state project in North Olmstead, O., requiring total of 1000 tons, has been let.

According to some sellers at New York, loose practices are beginning to crop out in the distribution of reinforcing steel and the 50c per ton truck delivery charge is especially under fire due to this low fixed rate. As a result some changes may be petitioned for in the reinforcing steel code.

Contracts Placed

800 tons, plant, Mathieson Alkali Works Inc., Lake Charles, La., to unstated interest.
650 tons, lock No. 22, Saverton, Mo., to Laclede Steel Co., St. Louis; James Metzger, New York, general contractor.
435 tons, bridge, Oregon, Ill., to Calumet Steel Co., Chicago.
400 tons, state hospital buildings, Rockland county, New York, to Carroll-McCreary & Co. Inc., Brooklyn, N. Y.; Amsterdam Bldg Co., general contractor.
350 tons, road work, Illinois, to Calumet Steel Co., Chicago.
230 tons, culvert in North Olmstead, O., state project, to Patterson-Leitch Co., Cleveland. Approximately 750 tons additional required; next letting in February.
225 tons, buildings and grain storage tanks for Spencer Kellogg & Sons, Superior, Wis., to Olney J. Dean & Co., Chicago; through Barnett & Record Co., Minneapolis.
150 tons, plant addition, Philco Co., Philadelphia, to Concrete Steel Co., Philadelphia.
150 tons, on two schedules for Boulder dam, Boulder City, Nev., to Truscon Steel Co., Youngstown, O., and Soule Steel Co., San Francisco.
144 tons, state bridges in Los Angeles and Humboldt county, California., to unnamed interests.
125 tons, state highway bridges, Sullivan-Suffolk counties, New York, to Kalman Steel Corp., Bethlehem, Pa.
115 tons, plant addition for the Celanese Corp., Ancelle, Md., to Kalman Steel Corp., Bethlehem, Pa. This seller also has booked 60 tons for the Richmond street power plant, Philadelphia, through United Engineers & Constructors Inc., Philadelphia; 180 tons more for this plant are expected to be placed momentarily.
100 tons, bridge and approaches, Elbert-Wilkes counties, Georgia, to Virginia Steel Co. Inc., Richmond, Va.; through G. A. Thomason & Co., Greenwood, S. C.
100 tons, or more, bridges, Shelby county, Tennessee, to Jones & Laughlin Steel Corp., Pittsburgh; Forcum-James Co., Memphis, Tenn., general contractor.

Concrete Awards Compared

	Tons
Week ended Jan. 20	**3,899**
Week ended Jan. 13	**9,359**
Week ended Jan. 6	**3,257**
This week in 1933	**3,205**
Weekly average for 1933	**3,771**
Weekly average, 1934	**5,505**
Weekly average, Dec.	**5,283**
Total to date 1933	**13,891**
Total to date 1934	**16,515**

Contracts Pending

10,000 tons, sewage disposal project, Chicago sanitary district; bids being taken weekly on several tunnels, each requiring 700 tons. No dates set for bids on remainder.
2300 tons, Ambursen side dam of Bonneville, Wash., project; Johnson Bros., Seattle, low.
1000 tons, state highway projects, mainly Saratoga, Nassau and Queens counties, New York; bids Jan. 26.
1000 tons, causeway, Mare Island, Calif.; general contract to Clinton Construction Co., San Francisco.
575 tons, lock No. 10, Mississippi river, Guttenberg, Iowa; bids Jan. 30 to United States engineer, Rock Island, Ill. Project also takes 142 tons of steel forgings and castings.
500 tons, substructure, Fore river bridge, Quincy-Weymouth, Mass.; V. Bartletta Co., Roslindale, Mass., low, $912,112.40. Work also takes several hundred tons of steel piling.
500 tons, lock No. 18, Mississippi river near Burlington, Iowa; Maxon Construction Co., Dayton, O., awarded general contract.
500 tons, postoffice ramps, Pittsburgh; bids postponed to Jan. 26.
500 tons, city bridge, Norfolk, Va.
425 tons, state hospital buildings, Brentwood, Long Island, N. Y., La Sala Mason Corp., low.
400 tons, Philadelphia approach to high speedline over Delaware river bridge, that city; Builders Inc., Philadelphia, low on general contract.
259 tons, state crossing in Ventura county, California; bids Jan. 17.
216 tons, state bridge over American river, Sacramento county, California; bids Jan. 31.
200 tons, Calvert street bridge, Washington; bids postponed to Feb. 5.
130 tons, two state bridges in San Diego county, California; bids Jan. 31.
125 tons, highway projects, Texas.

mainly Bexar county; bids in Jan. 22.

115 tons ,highway, route 25, section 9 Cinnaminson road to Union Schoolhouse road, Burlington and Camde counties, New Jersey; bids Jan. 22.

100 tons, highway underpass and bridge, on proposed government railroad from Fort Peck, Montana, dam site to Great Northern railroad; bids Jan. 25 to United States engineer, Kansas City, Mo.

100 tons, state road work, Lackawanna county, Pennsylvania; bids rejected.

Railroads

Track Material Prices, Page 39

Orders from railroads are slow to reach mill books. A factor of delay is found in complications in quoting under the steel code. Complete tabulation of bids on about 11,000 tons of miscellaneous steel for the New York Central Jan. 11 will require several days. On some items, prices run to eight decimals. Proper freight allowances also are found uncertain. Change in design of angle bars for the New Haven has delayed closing on its 10,000 tons of fastenings.

Edgar Thomson mill of Carnegie Steel Co., Braddock, Pa., plans a rail rolling for February on orders for the Pennsylvania, Pittsburgh & West Virginia and Atlantic Coast Line. Rail purchases by the Illinois Central and Chicago & North Western have been deferred by financing. Rail mills in the Chicago district have been idle for some time.

New York, New Haven & Hartford has been allotted a PWA loan of $2,000,000 for the purchase of 50 passenger cars. PWA has authorized a $500,000 loan to the Lehigh Valley for five locomotives and $40,000 to Midland Continental for one locomotive.

Interstate commerce commission has approved the PWA loan offered to the Illinois Central for the purchase of 21,600 tons of 112-pound rails, with fastenings and accessories. Boston & Maine has asked the commission to approve a proposed PWA loan of $3,330,000, of which $2,230,000 will be used for purchase of 30,000 tons of rails and fastenings and $1,100,000 for car and locomotive repairs.

St. Louis & San Francisco, in receivership, has asked the federal court for permission to make a PWA loan of $1,442,545 for 26,000 tons of rails, 42,600 repairs of rail joints, 5000 tons tie plates and other accessories.

At the request of some carbuilders, bids on 7800 freight cars and 26 coaches for the Chesapeake & Ohio; and on 1200 freight cars and 8 coaches for the Nickel Plate have been postponed from Jan. 15 to Jan. 22. Erie railroad previously announced similar postponement on 3775 freight cars and 133 coaches. Car builders still are endeavoring to obtain approval of their proposed code. Railroads, however, are not required to submit equipment bids to the federal railroad administrator.

New York Central railroad closes Jan. 29 on steel wheel requirements.

Atchison, Topeka & Santa Fe has placed about 6000 tons of fastenings, including 3800 tons of tie plates, to accompany its recent letting of rails. Production of fastenings has been better than that of rails in recent weeks.

Rail Orders Placed

Naval aircraft factory, Philadelphia, 100 tons of rails, frogs, switches and fastenings to Bethlehem Steel Co., Bethlehem, Pa.

Car Orders Pending

New York, New Haven & Hartford, 50 all-steel coaches, contemplated; also a high-speed streamline train for operation between Boston and Providence; material now being purchased for repairs to 1200 freight cars.

Locomotives Pending

Lehigh Valley, five locomotives; PWA loan approved.

Louisiana & Arkansas, three 2-8-2 type.

Midland Continental, one locomotive; PWA loan approved.

Rail Orders Pending

Boston & Maine, 30,000 tons rails and fastenings; PWA loan approval asked.

Illinois Central, 21,600 tons 112-pound, and fastenings, PWA loan approved.

New York, New Haven & Hartford, 25,000 tons of 112-pound rail, 10,000 tons fastenings, government loan approved.

St. Louis & San Francisco, 26,000 tons, and necessary fastenings; PWA loan applied for by receiver.

United States engineer, Kansas City, Mo., 850 tons for proposed government road connecting Fort Peck, Mont., dam site with Great Northern; bids Jan. 25.

Pipe

Pipe Prices, Page 39

Orders for tubular products in the Pittsburgh district for the first half of January were ahead of the same two weeks of December, but shipments have been less. Pipe producers are preparing estimates on the 27,500 feet of 28-inch butt weld pipe for the United States engineer's office at Kansas City, Mo.; bids to go in next week.

Dullness prevails in pipe markets at Chicago, with delays being encountered in closing on several of the larger jobs pending. Prices there are firm.

Preliminary figures indicate an unusually large volume pipe installations planned for the spring and summer in Buffalo district. Outlook for pipe business is said to be the best in recent years.

Production is somewhat improved in the Birmingham, Ala., pipe plants, although awards are slow.

New York reports code limitations have exerted a steadying influence on pipe prices, eastern foundries quoting $42, foundry, for 6-inch and over.

Inquiry for cast pipe in the Boston district is heavier. City of Boston is inquiring for 2500 tons of pit cast pipe and additional tonnage of fittings and accessories. Providence, R. I., placed 6000 tons with the Burlington, N. J., foundry.

Cast Pipe Placed

6000 tons, Providence, R. I., to United States Pipe & Foundry Co., Burlington, N. J.

300 tons, mainly 12-inch sewage and water system, state hospital, Woodbourne, N. Y., to United States Pipe & Foundry Co., Burlington, N. J.

200 tons, 6-inch, national park service, department of interior, to United States Pipe & Foundry Co., Burlington, N. J.

Unstated tonnage, 1900 feet, 36-inch, 20-foot lengths, corrugated galvanized iron, Fort Sam Houston, Texas, to Western Metal Mfg. Co., San Antonio, Tex.

Cast Pipe Pending

2500 tons, 6 to 16-inch, pit cast, Boston; bids Jan. 26. Will take this tonnage as minimum, asking right to specify more at same price. City also takes bids Jan. 25 and 26 on 725 tons of castings, boxes, frames, covers, bends, curves, gate and hydrant castings.

1000 tons, Georgetown, Mass.; application made for federal loan.

465 tons, 4 to 12-inch, class 150, Austin, Tex.; bids in.

420 tons, 8 and 12-inch, Beaumont, Tex.; Central Foundry Co. and National Cast Iron Pipe Co., Birmingham, Ala., low.

200 tons, 2-inch, Los Angeles; bids opened.

125 tons, 6, 8 and 10-inch, Like Oak, Fla.; loan approved.

Unstated tonnage, 12,895 feet, 6, 12 and 30-inch, bureau of water supply, Baltimore; bids Jan. 24.

Unstated tonnage, Hamburg (suburb of Buffalo), N. Y.; considering expenditure of $50,000 for extension of municipal waterworks.

Unstated tonnage, blanket requirements, Cambridge, Mass.

Strip Steel

Strip Prices, Page 39

Orders for strip steel at Pittsburgh have been larger than during the same December weekly periods. However, heavy December buying was not done in strip steel because prices did not change Jan. 1. The market on hot-rolled is 1.75c, and on cold-rolled 2.40c base, Pittsburgh, with the probability still strong that an advance will be made soon.

Additional improvement is recorded in strip steel demand at Chicago. Cold-rolled material is moving more actively to automotive interests, improvements in this product being greater than in hot-rolled. Production is better than 30 per cent. Prices remain 2.40c, Pittsburgh-Cleveland, for cold-rolled strip, with hot strip 1.85c, Chicago.

Although consumers stocks in the New York area are understood to be low, there is little buying of strip. Prices are 2.08c, New York, for hot-rolled strip and 2.73c, New York, for cold-rolled.

Improvement is noted in automotive strip demand at Cleveland, but the gain is not as pronounced as in sheets. Comparatively few consumers are contracting for first quarter, with prices unchanged. Some fairly good sales have been made to shovel, wheelbarrow and other implement makers.

Consumers in eastern Pennsylvania are buying little. It is believed their stocks are small. Prices continue 2.69c, Philadelphia, for cold-rolled, and 2.04c, Philadelphia, for hot-rolled.

Improvement in buying of cold strip is apparent in New England, but some larger users have large stocks. Most present purchasers specify immediate delivery.

Wire

Wire Prices, Page 39

The wire market still reflects an over-bought condition, with the earliest relief promised in February when jobbers will begin to buy merchant products for the rural trade.

A Pittsburgh wire mill is contemplating closing down, owing to a scarcity of orders. The market is firm, however, at 2.20c base, Pittsburgh, on plain wire and $2.35 a keg for nails.

Demand for wire and wire products continues to increase slowly at Chicago and is definitely more active than during early January, when business was retarded by heavy shipments of the preceding 30 days.

Wire sales at Cleveland are substantially larger than the weekly average during December. For one important producer the week's volume was close to 50 per cent of what it considers normal in the Cleveland territory.

At Detroit some large orders have been booked for cold-finished steel for fabrication into coiled automobile springs.

Improvement in wire demand is noted by several New England mills. The increase has not covered general lines, but has been notably for industrial uses. Plain wire is steady at 2.30c, Worcester, Mass.

Tin Plate

Tin Plate Prices, Page 38

New York—While domestic contracting continues light, there is increasing inquiry for tin plate from abroad. Bids will be closed Jan. 31 on approximately 10,000 to 15,000 base boxes of tin plate by the Argentine state oil interests. Japan also is active.

Canmakers are predicting larger requirements this year than in 1932 when failure of peach and tomato crops in some important districts restricted consumption. Despite this, however, steel consumption for containers, largely tin cans, last year amounted to approximately 1,682,998 tons, within 563 tons of the 1929 peak.

Pittsburgh—Tin plate operations steadied last week at 40 per cent, with a leading interest at 52 per cent and the independents in the district averaging around 25 per cent. Many of the latter are producing stock sizes. Only a few releases from canmakers are in the market, and not all producers have shared alike in this business. The price is firm at $5.25 per base box, with long ternes 3.25c, and tin mill black sheets 2.65c.

Cold Finished

Cold Finished Prices, Page 39

Pittsburgh—Automotive buying of cold-finished steel bars is impending but delayed. Jobbers have not bought to any extent, having one to three months' supply. Miscellaneous manufacturers are not active in commitments. The market is firm at 2.10c, Pittsburgh, with turned and ground shafting 2.45c, Pittsburgh, now quoted on 2-15/16 to 7 inches, the maximum of this bracket formerly having been 6 inches.

Pig Iron

Pig Iron Prices, Page 40

Pig iron sales for the past week were featureless, being confined largely to fill-in tonnages. No important inquiries have developed.

Sales and shipments, though well below the December rate, continue to expand in the Chicago district. Foundries supplying automotive plants are operating at an improved rate. Prices there are unchanged.

A code ruling on delivered prices by water, which allows a 60-cent reduction per ton delivered, dock, at Burlington and Florence, N. J., on shipments of 400 tons or more, has enabled the New England pig iron producer to compete for mid-Atlantic coast cast pipe foundries' business. The ruling also applies to other points on the north and mid-Atlantic seaboard.

Some sellers, notably at Philadelphia, look for no marked improvement before March.

The merchant iron market at Pittsburgh continues slow, with melters showing disinclination to contract. Prices are firm.

Shipments by Cleveland furnace interests this month, according to present indications, will amount to about 40 per cent of the December volume. Sales are tending to improve.

Foundry operations at Cincinnati have not expanded sufficiently to induce further contracting by those interests with heavy carryovers from November and December. American Rolling Mill Co.'s stack at Columbus, O., is now in blast on basic iron.

Five furnaces continue in at Buffalo. Sellers report inquiries confined to small lots.

Merchant sales in the Toronto, Ont., district are gradually improving, both in number and tonnage, although no advance contracting is reported.

Aggregate tonnage sold in the Birmingham, Ala., region is about equal to current production, with small lot sales predominating. The market is quiet at St. Louis, with all melters well covered.

Semifinished

Semifinished Prices, Page 39

Makers of semifinished steel are slowing down in their production for stock. Banked supplies of sheet bars and billets generally are adequate. Prices are firm at $26, Pittsburgh, for sheet bars, billets and slabs. Wire rods are $36, Pittsburgh or Cleveland.

Scrap

Scrap Prices, Page 41

Pittsburgh—No. 1 heavy melting steel has advanced 75 cents a ton, the market now being quoted $13.25 to $13.75. Following upon the 5000-ton sale of heavy melting steel by the Pennsylvania railroad at $14, a district mill last week bought several thousand tons of straight No. 1 heavy melting, paying $13.75. Machine shop turnings have sold at a top of $10 in this district. Cast scrap is showing strength, and specialties are up as a result of the Pennsylvania sale.

Cleveland—With increasing production demand for steel and iron scrap shows better possibilities and sentiment is more hopeful. Prices show strength and several advances have been made to keep in line with other consuming centers. Shipments are moderate.

Chicago—Scrap prices are at about last summer's peak following further advances recently. Heavy melting steel, although bought by mills at $10.50, only infrequently can be picked up by dealers at less than that figure and the market ranges from $10.50 to $10.75. Railroad scrap commands even more. Mill buying is marking time, following moderate sales recently.

Boston—Scrap prices are strong, notably No. 1 heavy melting steel. Dealers are paying up to $7.25 for shipment to the Pittsburgh district, $6.75 for Eastern Pennsylvania, while Worcester pays $8.25, delivered. No. 2 melting steel relatively is not as strong.

New York—Sharp advance in No. 1 heavy melting steel for barge loading, with firmer prices on practically all active grades features the heavier demand for scrap. For barge loading dealers are now paying $9 for No. 1 steel. This grade is not coming out freely in view of the better domestic demand, although most buying in New York proper is for export, with a heavier movement in Northern New Jersey to Eastern Pennsylvania mills.

Philadelphia — Nominal advances in No. 1 melting steel and other leading grades reflect the strong undertone. Consuming demand generally continues restricted, but indications point to increased buying soon. Recent consuming orders include 600 tons of No. 1 forge fire for a Reading, Pa., consumer, reported placed at $11, delivered, and 250 tons of No. 2 steel for a local consumer, awarded at $9.50, delivered.

Buffalo—A Buffalo consumer has purchased 1500 tons of short mixed borings and turnings at a price reported to be $7.50. Other markets are equally firm and dealers look for further substantial buying.

Detroit—Consumers are not conspicuous in the iron and steel scrap market, but dealers are in a speculative mood and are bidding the market up. There is some buying for storage on docks for spring shipment. While more scrap is being offered, delay in getting new models in production has kept offerings under expectations. Most prices are up 25 to 75 cents on the basis of dealer activity.

Cincinnati—Absence of mill buying continues to cause dullness in the iron and steel scrap market. A strong undertone is evident. Current prices to supply the demand for small lots so that an increase, in sympathy with nearby districts, is not justifiable.

St. Louis—A few small scrap grades of special material changed hands, at the top figures of the recent advance. Inquiries by mills cover substantial tonnages.

Birmingham, Ala.—Lagging conditions in scrap continue, with readjustment in prices of several grades. Heavy melting steel has advanced.

Toronto, Ont.—New interest is developing in iron and steel scrap. While steel scrap sales are at a minimum, it is understood that inquiries are beginning to appear from European consumers and dealers expect good demand for heavy melting steel for export with the opening of St. Lawrence navigation. Iron grades furnish most new business and demand is improving. Cast scrap and malleable are in limited supply.

Warehouse

Warehouse Prices, Page 42

Warehouse sales are increasing moderately but steadily. Prices are unchanged except for some adjustments.

As January wears on the situation in the iron and steel warehouse business at Detroit becomes increasingly encouraging. Orders are more numerous.

Sales have started to increase at Chicago earlier than usual and broad diversification is encouraging to jobbers. Practically all miscellaneous manufacturers are more active, the exception being building construction, which continues quiet.

Cold-finished steel bars out of Pittsburgh warehouse are 3.45c, for in-town Pittsburgh delivery, with the usual differential of 10 cents off for out-of-town destination. However, a change has been made in quantity extras, and lots under 300 pounds now take $1.25 extra. This supersedes an extra of $1.25 for less than 100 pounds and $1 extra on 100 to 299 pounds.

All hot-rolled and sheet prices out of Pittsburgh warehouse are unchanged except the following new prices on galvanized roofing per square: 25 bundles and over, 3.48c; 10 to 24 bundles, 3.69c; and one to nine bundles, 3.90c.

At Cleveland the number of orders is holding up and warehouse interests expect January will be a fair month. General manufacturing requirements are improving.

Volume with most New York district warehouses has increased, in some instances a sharp improvement.

Sales of steel from warehouse at Cincinnati are steady and demand is broad from industrial users.

Warehouse volume in New England has improved, with buying well spread, prices firm. Miscellaneous requirements are heavier.

Coke

Coke Prices, Page 39

The market on standard beehive furnace coke has been reduced 25 cents a ton, effective Jan. 15, applying at least to April 1. Thus, on a Connellsville oven basis, the market is now $3.50. Prices on both premium and common grades of foundry coke have been unchanged.

Foundry demand at Chicago is increasing movement of by-product fuel considerably above the December rate. Cincinnati sellers also find foundry needs taking larger lots.

St. Louis suppliers of by-product coke have been surprised at January sales following heavy December movement.

Bolts and Nuts

Bolt, Nut, Rivet Prices, Page 39

Forthcoming railroad needs for bolts and nuts for freight car building and automotive manufacture hold promise of large buying. Farm implement builders are purchasing more than a year ago. Jobbers are well stocked though their sales show a gain.

Bolts and nuts continue at 70 off list and large rivets at 2.75c, base, Pittsburgh and Cleveland, 2.85c, Chicago. Small rivets are 70 and 10 off.

Information to nut and bolt interests at Cleveland is that automobile manufacturers will be running at "top speed" for the greater part of the first half, to make up delay in getting under way with new models.

Metals

Nonferrous Metal Prices, Page 39, 41

New York—The metals were generally more active and stronger last week with the exception of tin. President Roosevelt's announcement of the government monetary policy was a strengthening factor.

Copper—Copper firmed up markedly on reports that producers are nearer agreement on a code, which may set the minimum price at 9.00c, and clarification of the monetary policy. The price rose to 8.25c Thursday and went still higher Friday.

Lead — Active buying developed but prices failed to advance above 3.90c East St. Louis, 4.00c, New York.

Zinc—Consumers displayed more interest and sellers generally moved their prices to the basis of 4.30c, East St. Louis.

Tin—Tin declined due to strengthening in the value of the dollar in terms of sterling exchange. The metal slid to 51.25c Thursday but recovered somewhat Friday.

Antimony—Prices eased 5 points to 7.20c despite announcement recently that output in China would be restricted.

Aluminum—Secondary metal continued to gather strength due to scrap scarcity. Virgin was unchanged.

Equipment

Steel mill equipment market, while fairly active, is mainly concerned with work of a repair nature. Youngstown Sheet & Tube Co. has installed two spike machines at its Struthers, O., works, having purchased these machines from the Bethlehem Steel Co., according to Pittsburgh reports.

In connection with the Youngstown company's recently announced changes in its electric weld pipe mill, to permit rolling and welding pipe down to 8⅝-inch diameter, the following new equipment is involved: Plate cleaning machine; roll equipment in the present forming machine to handle pipe from 8⅝ to 16-inch diameter; welding machine located between the present forming machine and present welding machines, to handle the smaller sizes; roll equipment for sizing and straightening machines to handle the smaller sizes; and necessary changes in cutting-off machinery and testing machines. Five more sets of sizing rolls may be added to handle pipe down to 2-inch diameter, if present tests are satisfactory.

Spang-Chalfant & Co. Inc., Pittsburgh, has placed an order for several pipe-threading machines with National Acme Co., Cleveland.

Roll buying has not expanded to any degree, although important pending work includes the possible purchase of a set of rolls for rolling a new piling section by a Pittsburgh steel sheet piling producer.

Illinois Steel Co. is relining a battery of 80 coke ovens at its Gary, Ind., works. Machine tool buying in the Chicago district has recovered moderately from the December lull.

Recent bids on a large list of tools for the navy department, delivery at Newport, R. I., account for the bulk of activity in the New England territory. Kearney & Trecker Corp. has booked eight milling machines for the navy at Washington, while the W. E. Shipley Machine Co. took 10 screw cutting lathes, same delivery.

For a New York city fire department repair shop, 12 machines, including lathes, have been placed, the list amounting to about $25,000.

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Pacific Coast

Pacific Coast Prices, Page 39, 40, 42

San Francisco—(*By Air Mail*)—A fair volume of business was booked during the week. Awards of structural shapes and reinforcing bars are considerably ahead of the first two weeks in 1933, while cast iron pipe and plate bookings are below last year's total. Now inquiries and projects about to be released for bids will require more than 18,000 tons of plates, shapes and reinforcing bars.

Unnamed interests took 144 tons for bridges in Los Angeles and Humboldt counties, California, for the state. Clinton Construction Co. was awarded the general contract for the causeway at Mare Island, Calif., requiring 1000 tons of bars and 1500 to 2500 tons of shapes.

Plate awards were small. Bids have been opened on 100 tons for a fuel oil system at Hamilton Field, California. The first four units of Central Valley water project in California will require over 2500 tons for pipe lines and drum gates. Bids have been rejected on 110 tons of 24-inch welded pipe for Inglewood, Calif.

Among structural awards were 150 tons for an addition to a brewery in Oakland, Calif., taken by the Western Iron Works, and 150 tons for a school in Richmond, Calif., booked by Schraders Iron Works. Unnamed interests took 750 tons of steel piling for highway work in Ventura county, California, for the state. M. B. McGowan, San Francisco, was low bidder on 3200 tons of steel piling for a bulkhead at Government island, Oakland, Calif. Neves & Sharp were awarded the general contract for 278 tons for a bridge over the Eel river in Humbolt county, California, for the state.

Northwest Activity Grows

Seattle—Private contractors having refused to bid on the Seattle Seawall job, the city will begin work by day labor next week. Materials bids will be requested, the first being for 3614 tons of steel sheet piling. The project approximates $1,400,000 and also includes 900 tons of cast iron pipe and 1745 tons of reinforcing bars.

Sheble Construction Co., Seattle, has the contract at $272,711 for a state overhead crossing on Fourth avenue south, Seattle, involving 900 tons of shapes and 300 tons of reinforcing bars. Parker-Schram Co., Portland, has a $75,000 contract for foundations for the 2,000,000-bushel grain elevator at Vancouver, Wash.

The week's awards include 100 tons of plates to Todd Dry Docks Inc., Seattle, for repairs to the hull of the American steamer TACOMA, damaged in the Orient. Crane Co., Seattle took 32 tons of 2, 3 and 4-inch steel gas pipe for Ft. Lewis, Wash. Some small cast iron tonnages are pending. No sub-award has been made on 2300 tons of reinforcing bars for the Ambursen side dam of the Bonneville project, Johnson Bros., Seattle, low.

Domestic demand for scrap is unimportant and Japanese buyers have not shown interest since the holidays. However, prices are firm and steamship space scarce. Higher levels may reasonably be expected as a considerable movement to the Orient is in prospect during the next three months.

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Steel in Europe

Foreign Steel Prices, Page 42

London—(*By Radio*)—Iron and steelworks generally are active, many having commitments for three months, and the general tone is confident. Light foundries are especially active. One blast furnace stack has been restarted and two more are likely to be added soon. Shipbuilding and structural materials are in better demand.

Pig iron production in December at 409,300 tons is a gain of 34,400 tons over that of November. Steel production at 668,900 tons for December is 26,100 tons less than in November. December imports and exports were both lower in December. Imports at 91,298 tons were 629 tons under November and exports at 173,081 tons were 11,310 tons lower.

The Continent reports improved export prospects, and prices are rising. Brussels is experiencing a higher domestic price on bars and plates. German mills have booked some steel hoops for American and other markets.

Red Hematite Now Shipped From North African Mine

Red hematite ore is being shipped for the first time from a mine at Marampa, in Sierra Leone, northwest coast of Africa, developed by the Sierra Leone Development Co. Ltd.,

London. Sales in this country are being handled by William W. Hearne, 814 Pennsylvania building, Philadelphia. The physical analysis of the ore follows:

Above 12"	a few lumps
12" to 8"	5.2%
8" to 4"	30.5%
4" to 2"	18.0%
2" to 1"	16.5%
1" to ½"	9.1%
½" to ¼"	11.1%
¼" to ⅛"	6.8%
Below ⅛"	3.0%

The chemical analysis:

	Dried at 212° (Per Cent)
Peroxide of iron	84.73
Protoxide of iron	0.32
Metallic iron	59.56
Silica	2.00
Manganese	0.06
Phosphorus	0.054
Sulphur	0.066
Combined water	5.840

The ore does not contain any lead, zinc or arsenic. Because of the low protoxide and the high combined water, it is said it will decrepitate and reduce to an average fineness. In making a basic pig iron it would be necessary to mix it with Sebabna or some other ore carrying a good percentage of manganese.

The company has built a narrow gage railroad from Marampa to Pepei, which is on the Rokell river about 15 miles from Freeport, which in turn is on the Atlantic ocean. From Pepel there is a navigable channel with a minimum depth of 28 feet at high tide and at Pepel there is a loading trough with a minimum depth of 30 feet at low tide.

At Pepel the company has installed a storage bunker capable of holding 75,000 tons equipped with a conveyor belt which moves the ore to an adjustable chute which discharges it into a steamer's hold. The equipment is designed to load steamers at the rate of 2000 tons per hour. The mine, railroad, docking and loading facilities are owned by the English company.

Died:

(*Concluded from Page* 19)

Born in Scotland, his first connection with the steel industry was in the Homestead works of the Carnegie Steel Co., later going to the Bellaire, O., works of this company. In 1895 he resigned to become associated with the Ohio Steel Co. in Youngstown, now the Ohio works of the Carnegie company.

□ □ □

Edwin McEwen, 65, recently managing director, H. H. Franklin Mfg. Co., Syracuse, N. Y., at his home in Cleveland, Jan. 10. For some years he was identified with the automotive industry in Cleveland, Toledo, St. Louis and other cities. At one time he was office manager of Cartwright, McCurdy & Co., Youngstown, O., steel hoop mills later sold to Carnegie Steel Co. and since dismantled.

□ □ □

Wellington W. Stickle, 42, purchasing agent for the Western Electric Co. in New York, at his home in Caldwell, N. J., Jan. 14.

□ □ □

Walker D. Hines, 63, a leading American lawyer and director general of the railroads during the final year of federal control, at a sanitarium in Merano, Italy, Jan. 14.

□ □ □

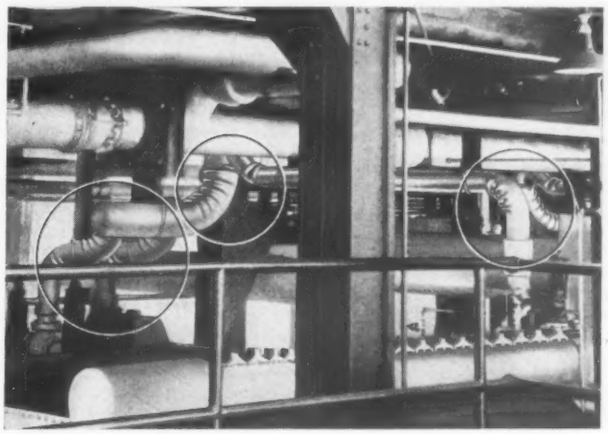
George C. Ames, 67, former president of the American Brake Shoe & Foundry Co., New York, in Washington, Jan. 17. He retired several years ago.

□ □ □

Fred C. Dusing, member of the firm of Dusing & Hunt, Buffalo, credited with being the inventor of the modern metal fire door, in Buffalo, Jan. 17, after a long illness.

□ □ □

John Sherwin Sr., 65, long prominent in Cleveland banking and industrial circles, in Cleveland, Jan. 16. He was a director and member of the executive committee of the Otis Steel Co., and a director of the Kelley Island Lime & Transport Co. and of the Valley Mould & Iron Corp.



Creflex Welding Fittings eliminated 12 Line Welds

The use of Creflex Welding Fittings with long tangents in the safety valve exhaust lines shown above, not only eliminated a dozen line welds, but also reduced the number of welded joints to a minimum.

The longer tangents of these fittings removed all necessary welds far from zones of high stress, and provided a higher factor of safety in the welds.

Greater ease and speed in lining up preparatory to welding and fewer welds to be made, lowered installation costs on this job.

Learn the advantages of this type of welding fitting. Get the facts today by writing for Bulletin W-101 which gives full information and list prices.

Pittsburgh Piping & Equipment Company

43rd St. & A. V. R.R. PITTSBURGH, PA.

BRANCH OFFICES

NEW YORK CHICAGO CLEVELAND DETROIT
INDIANAPOLIS BOSTON HOUGHTON, MICH.

Here and There In Industry

INLAND STEEL CO., Chicago, has appointed Pidgeon-Thomas Iron Co., Memphis, Tenn., exclusive agent for the sale of steel sheet piling in Memphis and surrounding territory in western Tennessee.

□ □ □

American Iron and Steel institute has removed its offices from the eighteenth to the thirty-third floor of the Empire State building, New York.

□ □ □

H. A. Brassert & Co., Chicago, engineers, have received an order for Brassert high-efficiency zoned hot blast stoves from Bethlehem Steel Co. for its Johnstown, Pa., plant.

□ □ □

William H. Muller & Co., Rotterdam, Holland, manufacturers of iron, steel and railroad supplies, has moved its offices to Willemsplain Nr. 5, postoffice box 770.

□ □ □

Security Engineering Co., Whittier, Calif., manufacturer of oilfield drilling equipment, has appointed Wilson Supply Co., Houston, Tex., its distributor in mid-continent and gulf coast territory.

□ □ □

Universal Power Corp., Cleveland, has appointed F. R. Faulk, 50 Penn avenue, Pittsburgh, district sales representative for its arc welders, accessories and welding electrodes. Welding Equipment & Supply Co., 2720 East Grand boulevard, Detroit, has been appointed distributor for the same concern.

□ □ □

New Process Gear Co. Inc., Syracuse, N. Y., has been placed in receivership by federal court on petition of National Malleable & Steel Castings Co., Cleveland. Clarence R. King has been appointed receiver.

□ □ □

Wolfton Mining Co., Boulder, Colo., is opening its mines to leasers and will buy all the tungsten ore produced for reduction later. Prices range from $26.40 per ton on 5 per cent ore to $261 for 30 per cent ore and $720 for 60 per cent ore.

□ □ □

General Steel Wares Ltd., Toronto, Ont., has arranged with Canadian Nickel Products Ltd., marketing subsidiary of the International Nickel Co. of Canada Ltd., to take over the manufacture and sale of monel metal hot water tanks in Canada.

□ □ □

Laclede Christy Clay Products Co., St. Louis, manufacturer of refractory products, has increased operations 130 per cent since July, compared with the same period in 1932. Indications are a profit will be shown instead of a deficit, which was nearly $95,000 in 1932.

□ □ □

Big Three Welding & Equipment Co., Forth Worth, Tex., has moved its office and warehouse at Tulsa, Okla., to 103 South Cheyenne avenue, where larger quarters are available. The company is distributor for Lincoln Electric Co. and Harris Calorific Co., both of Cleveland. W. B. Whenthoff is manager of the Tulsa office.

□ □ □

Ferro Enamel Corp., Cleveland, finds its December sales the largest in its history and four times those of December, 1932. For the entire year sales were one-third greater than in 1932, the last three quarters practically doubling the corresponding period of the preceding year.

□ □ □

Frank Samuel & Son Inc., Harrison building, Philadelphia, steel, iron, iron ores and ferroalloys, has been appointed by A. Thun & Co. Ltd., Rio de Janeiro, Brazil, sole agent in America for the sale of its iron, manganese, and manganiferous ores.

□ □ □

Metal Industries association of the Washington district of the Pacific coast has been formed with headquarters at 103 Chamber of Commerce building, Seattle. Metal plants in the state of Washington classifying under the fabricated metal products manufacturing, metal finishing and metal coating code will be governed by this body. J. S. Brinkley is secretary. Association officers appointed regional code authorities by NRA officials, in addition to the secretary, are: O. R. Rabel, Seattle, president; S. K. Prescott, Everett, Wash., and H. R. Washington, Seattle, vice presidents.

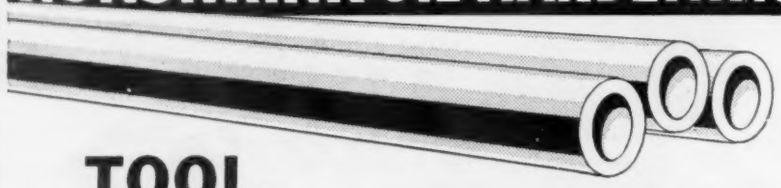
□ □ □

Central Iron & Steel Co., Harrisburg, Pa., has appointed Potter & Dugan Inc., Court and Wilkeson streets, Buffalo, district sales manager for New York west of Schenectady, and for Erie and Bradford, Pa., for its products, including sheared steel plates and sheets, universal plates, blue annealed sheets, flanged and dished heads, forging steel, punchings and stampings. The same company has appointed Theodore Geissman & Co. Inc., 180 North Michigan avenue, Chicago, district sales agent for Illinois and Indiana, with a few exceptions, Wisconsin, Iowa, Missouri, except St. Louis, and for Omaha, Nebr.

□ □ □

Smith-Mayer Corp., 16374 Euclid avenue, Cleveland has been formed to engineer and manufacture industrial ovens, conveyors, air heaters, air conditioning and allied equipment, by James Campbell Smith and C. F. Mayer. Mr. Smith has been engaged in private practice in design of equipment, formerly was manager at Detroit for McCann-Harrison Corp. and previously manager at Pittsburgh for the Swartwout Co., Cleveland. Mr. Mayer recently resigned at vice president of the Foundry Equipment Co., Cleveland, and previously was manager of the oven department of the Swartwout Co. Manufacture of its products will be by contract for the present, with a plant probably later.

NONSHRINK OIL HARDENING



TOOL STEEL TUBING

Manufacturers of BISCO Tungsten Carbide and Tantalum Carbide drawing dies for wire, rod and tubing.

A saving will be realized by using our Tool Steel Tubing. Carried in stock up to 12″ O.D. x 2″ wall thickness. It is excellent for all classes of dies, slitters, spacers, bushings, etc.

We also supply a special tubing conforming in analysis to S.A.E. 52100 and S.A.E. 4615 designed particularly for Ball Bearing purposes. Can be furnished in Hot Rolled or Cold Drawn finish.

THE BISSETT STEEL CO., Inc.

945 East 67th St., CLEVELAND, OHIO

Cincinnati **Pittsburgh** **Buffalo**

Construction and Enterprise

NEW YORK

ANGOLA, N. Y.—Enzinger Union Corp., Germany, has leased a factory building here and will open a branch plant for the manufacture of metal specialties.

BUFFALO—Maxton Metals Inc. has been incorporated to deal in steel, iron and metal scrap, with 200 shares no par value, by David Diamond, Prudential building, Buffalo.

BUFFALO—Contract has been completed for construction of the $1,000,000 Lovejoy sewer by the Chippewa Plumbing Co., Buffalo. A tonnage of reinforcing steel bars and some structurals will be required.

JAMESTOWN, N. Y.—Norquist Products Inc., Lloyd C. Dahmen president and general manager, has leased A. C. Norquist plant, Chandler street, and will start production of metal screens and furniture.

NEW YORK—Wilputte Coke Oven Corp., 400 Madison avenue, has been awarded a contract by Illinois Steel Co., 208 South LaSalle street, Chicago, for rebuilding two by-product coke batteries of 70 ovens each at its works at Gary, Ind.

NIAGARA FALLS, N. Y.—Union Carbide & Carbon Research Laboratories Inc. will move its entire metallurgical division from Long Island City, N. Y., to Niagara Falls, N. Y., as soon as a new plant at Royal avenue and Forty-seventh street has been completed at cost of $200,000. This will be the sixth plant of this company at Niagara Falls.

NEW JERSEY

NEWARK, N. J.—Metal Mfg. Co., has been incorporated with $2000 capital to manufacture metal products, by Eugene S. Borut, 330 Fabyan place, Newark, N. J., agent.

PENNSYLVANIA

KITTANNING, PA.—Plans are being drawn for a manual training school building on McKean street, maturity subject to approval of PWA loan. Tillman Scheeren Jr., Boartz building, Kittanning, Pa., is architect.

OHIO

GALION, O.—Central Ohio Steel Products Co., subsidiary of the Central Ohio Steel Products Co., has broken ground for an addition to its plant here. About 10,000 square feet floor space will be added for the manufacture of dump-body trucks. G. L. Stifel is president.

MICHIGAN

CHARLEVOIX, MICH.—CWA commission of Charlevoix county plans erection of a court house and jail to cost about $100,000.

DETROIT—S. Helper Co., 1907 National Bank building, has been incorporated with 100 shares no par value to deal in scrap iron and steel, by Harold Helper, 2262 National Bank building, Detroit.

DETROIT—Madison Foundry Co. Inc., has been incorporated with $10,000 capital to operate a foundry for the manufacture of metal products, by Howard H. Newman, 1488 Madison avenue, Detroit.

DETROIT—Roth Welding Engineering Co. Inc., 1161 Harper avenue, has been incorporated with $1000 capital and 100 shares no par value to design welding equipment, by Henry W. Roth, 806 West Oakbridge, Ferndale, Mich.

DETROIT—City Scrap Iron & Metal Co. Inc., 1890 East Hancock avenue, has been incorporated with $2000 capital, by Bertha Saks, 2492 Clairmount avenue, Detroit.

DETROIT—Automobile Lock Corp., 8824 Charlevoix avenue, has been incorporated with $5000 capital to manufacture locks, by Adam J. Urquhart, 1307 Dragoon avenue, Detroit.

DETROIT—McReynolds-Leslie Inc., 1324 Mt. Elliott Avenue, has been incorporated with $2000 capital and 1000 shares no par value to manufacture tools and dies, by Hubert L. Leslie, 7435 Bingham avenue, Detroit.

INDIANA

ANDERSON, IND.—Engineers of the Lynch Corp. are preparing plans for immediate remodeling and enlarging of the Ames Shovel Co. plant it recently acquired here. A division now operating at Columbus, O., will be removed here as soon as the plant is ready.

KOKOMO, IND.—Continental Steel Corp. suffered about $20,000 loss by fire in the burning of its roundhouse, a locomotive and one car being damaged.

MUNCIE, IND.—Household Helps Inc., 901 South Mulberry street, has been incorporated with 100 shares no par value, to produce household appliances, by Ray V. Sowers, 17 Berwyn road, Muncie, and associates.

SEYMOUR, IND.—Noblitt Sparks Industries Inc. is preparing its plant at Seymour for immediate use as the automotive industry improves. Buildings and equipment are being conditioned for operation.

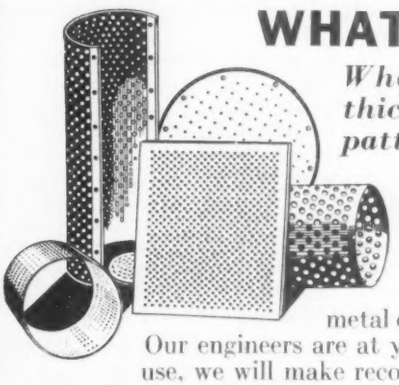
ILLINOIS

CHICAGO—Screw Machine Supply Co., 9 South Clinton street, has been incorporated with 200 shares capital stock to manufacture machinery, tools and appliances, by Abraham Greenfield, 77 West Washington street.

CHICAGO—Shakeproof Lock Washer Co., 2501 North Keeler avenue has been incorporated with 10 shares capital stock to manufacture nut locks, screws, screw locks washers, dies, machinery and parts, by Gardner & Carton, 1030 First National Bank building, Chicago.

CHICAGO—J. H. Keeney & Co. Inc., 2900 South Michigan avenue, has been incorporated with 200 shares capital stock to fabricate metal and wood novelties and toys, by Goldman, Allshouse & Healey, 5 South Wabash avenue.

PEORIA, ILL.—Wilkins Pipe & Supply Co., 1008 South Adams street, has been incorporated with 100 shares capital stock to manufacture general plumbing supplies, by Albert J. Well,



WHAT MUST IT DO?

What kind of metal? how thick? what size holes? in what pattern?

The correct answers spell the difference between perforated metal sold as merchandise and that planned the Wickwire Spencer way. The results . . . the metal does better work and has longer life. Our engineers are at your service, free. Let us know the use, we will make recommendations based upon scientific study. It costs no more to buy Perforated Metal in this way.

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WICKWIRE SPENCER
PERFORATED METALS

Well & Well, 907 Jefferson building, Peoria, Ill.

MISSOURI

ST. LOUIS—Kirk Mfg. Co., manufacturer of food servicing equipment, has leased a building at 1911 Locust street for office and plant. F. T. Hilliker is president.

OKLAHOMA

GARBER, OKLA.—Omar Refining Co. has been incorporated with $400,000 capital and has taken over the former Garber Refining Co. plant, which will be improved. F. S. Whitaker, Tulsa, Okla., is president.

TULSA, OKLA.—Webster Engineering Co., subsidiary of Surface Combustion Co., Toledo, O., has leased office and shop space at 419 West Second street for manufacture of combustion equipment. Building is 125 x 150 feet. Leon Reagan is branch manager.

WISCONSIN

ADAMS, WIS.—A. E. McMahon Engineering Co., Menasha, Wis., has been engaged by city council to prepare plans for a $100,000 water and sewage plant, for which federal aid is being sought. W. L. Werner is mayor.

EAU CLAIRE, WIS.—Power plant facilities of Gillette Rubber & Tire Co., here, will be enlarged at cost of $50,000, following completion of several plant extensions. Ralph W. Hutchens is president.

MILWAUKEE—Chain Belt Co. is removing operations of its subsidiary, Stearns Conveyor Co., from Cleveland to its main works here and will close the Cleveland plant soon.

MILWAUKEE—Moe Bros. Mfg. Co. manufacturer of electric fixtures, has contracted with Protexel Co., Ironwood, Mich., to manufacture its patented device for air conditioning bananas and other tropical fruit in northern warehouses and stores.

SHEBOYGAN, WIS.—Special election will be held April 3 on construction of first unit of new vocational school for which federal loan has been granted. C. E. Hulton is principal.

SLINGER, WIS.—St. Lawrence Distilling Co., P. J. Dunham, 2735 North Murray avenue, Milwaukee, has plans by R. B. Williamson, architect, 707 North Broadway, Milwaukee, for a new distilling plant at St. Lawrence, Wis., near here, with capacity of 550 to 600 gallons daily.

SUPERIOR, WIS.—Barnett & Record Co., Minneapolis, has been given general contract for adding 500,000 bushels grain storage capacity and handling equipment at Superior plant of Kellogg Elevator & Grain Corp., Minneapolis.

SOUTH DAKOTA

ABERDEEN, S. DAK.—Hub City Iron Co. has been incorporated with $100,000 capital, by Ansel T. Green and Robert J. Fritsche, Aberdeen, S. Dak.

IOWA

WATERLOO, IOWA—National Metal Products Co., formed by a group of Waterloo business men to operate the washing machine and cabinet plants of the Silvers Mfg. Co., has elected C. E. Butler, president.

MONTANA

HELENA, MONT. — Preliminary work has been started by the government on a dam at Fort Peck on the upper Missouri river, including irrigation works and a 90,000-horsepower hydro-electric plant. An appropriation of $25,000,000 is available this year for diversion tunnels and other work. Total cost is $60,000,000.

MISSOULA, MONT. — Bureau of roads has awarded a contract for a 210-foot concrete and steel bridge over the Yaak river to Hansen Construction Co., Opportunity, Wash., at $25,949.

IDAHO

SANDPOINT, IDAHO—Plans are being made for expenditure of $68,000 in improvements for the waterworks system. Federal loan is being sought.

PACIFIC COAST

PORTLAND, OREG.—War department, Washington, has approved revised plans for a bridge at The Dalles, Oreg., providing for a swing span instead of a single leaf bascule.

PORT ANGELES, WASH.—Washington Pulp & Paper Co. plans a canal 20 feet wide and 200 feet long, lined with steel sheet piling.

PORT ANGELES, WASH. — Bids will be asked soon for an air base project at Ediz Hook, Wash., including a hangar 100 x 120 feet, with ramp; shop building 20 x 100 feet, and other structures. Port is for use of coast guard.

SEATTLE — Century Brewing Co. plans a brewery at Portland, Oreg., J. C. Donnelly, manager. The company has leased a building in S.W. Oak street formerly occupied by the Cudahy Packing Co., as a distributing base.

VANCOUVER, WASH.—American Terminal Co. will build a marine oil station on property of the Fletcher Oil Co., including two tanks of 30,000 gallons capacity.

VANCOUVER, WASH. — Pacific Continental Grain Corp. will build a dock 1000 feet long and elevator with capacity of 2,000,000 bushels on Columbia river, at cost of $1,200,000.

DOMINION OF CANADA

OWEN SOUND, ONT.—Eureka Refrigerator Co. is remodeling its plant and installing new equipment. The plant is being placed in production after a shut-down of six months.

ST. THOMAS, ONT.—St. Thomas Stamping & Enameling Co. has reopened its plant on limited production after being closed more than a year.

TORONTO, ONT.—British Small Tools Manufacturers is establishing a plant here for the manufacture of tools of carbon steel and chrome vanadium steel.

New Trade Publications

SPIRAL PIPE—Taylor Forge & Pipe Works, 50 Church street, New York, has issued Catalog No. 33 describing its spiral pipe for various uses.

AIR HEATERS—Electric air heaters for a wide variety of industrial applications are illustrated and described in a bulletin of Edwin L. Wiegand Co., Pittsburgh.

RECORDING INSTRUMENTS — Brown Instrument Co., Philadelphia, is distributing its new catalog, No. 6702, describing 19 features of the new Brown recording thermometer and gage.

X-RAY INSPECTION — Electro-Alloys Co., Elyria, O., in Bulletin No. 200 describes methods employed in subjecting Thermalloy castings to X-ray inspection. Illustrations show methods and results.

GATE VALVES—Western Gas Construction Co., Fort Wayne, Ind., in Bulletin 305 presents descriptions, drawings and data tables of its line of gate valves designed for handling hot and cold gases.

SPEED REDUCERS—Falk Corp., Milwaukee, has published bulletin No. 270 describing its line of integral type and all-motor type reducers. Information is included on recent additions to the line.

SCREW CONVEYORS — Link-Belt Co., 2410 West Eighteenth street, Chicago, has issued a data book on screw conveyors, No. 1289, covering its helicoid and sectional-flight screw conveyors. It is well illustrated and contains data and list prices.

PLASTIC PRODUCTS—General Electric Co., Schenectady, N. Y., has issued a price list and data booklet, No. 937C, describing three types of plastic materials manufactured by this company and their various grades. Nonmetallic gears and machining of Textolite are described. Data are presented on cutting charges, tolerances and price lists.

STAINLESS CLAD—Ingersoll Steel & Disc Co., 310 South Michigan avenue, Chicago, has issued a bulletin on its mild carbon steel clad with stainless steel. It contains installation views of tanks, pressure vessels, autoclaves, yeast culture tanks and other applications. The text deals with a wide variety of applications.

FLEXIBLE COUPLINGS—An illustrated catalog on flexible-shaft couplings has been issued by the Link-Belt Co., 519 North Holmes avenue, Indianapolis. Three types are discussed, including one which employs a roller chain made by that company. Both revolving and stationary types of automatic-lubricating casings are included.

FLEXIBLE SHAFTS—N. A. Strand & Co., 5001 North Lincoln street, Chicago, has issued catalog No. 26 illustrating and describing its complete line of flexible shafts and equipment. These machines may be used in grinding, polishing, buffing, scratch brushing, rotary filing, sanding, drilling, reaming, tire buffing, nut setting, screw driving, filler rubbing and many other operations.